REPORT OF
AIR POLLUTION SOURCE TESTING
OF AN ETHYLENE OXIDE EMISSION-CONTROL SYSTEM
OPERATED BY STERIGENICS U.S., LLC.
IN QUEENSBURY, NEW YORK
ON DECEMBER 12, 2019

Submitted to:

NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION
P.O. Box 220
232 Hudson Street
Warrensburg, New York 12885-0220

Submitted by:

STERIGENICS US, LLC.
84 Park Road
Queensbury, New York 12804

NYDEC Permit Number 5-5344-00029/00011

Prepared by:

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Prepared on:

December 15, 2019

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1.0 INTRODUCTION

On Wednesday, December 12, 2019, ECSi performed air pollution source testing of an ethylene oxide (EtO) emission-control system operated by Sterigenics U.S., LLC. in Queensbury, New York. The control device tested is a Donaldson EtO Abator catalytic oxidizer, which is currently used to control emissions from ten EtO sterilizer backvents and five aeration rooms/cells. The purpose of the testing program was to evaluate compliance with EPA requirements under the current National Emissions Standards for Hazardous Air Pollutants (NESHAP), and with the conditions established in the permit (Number 5-5344-00029/00011) granted to Sterigenics US, LLC. by the New York Department of Environmental Conservation (NYDEC).

2.0 EQUIPMENT

The EtO gas-sterilization system is comprised of eleven commercial sterilizers, all discharging through liquid-ring vacuum pumps to a packed-tower acid scrubber emission control device. In compliance with NYDEC and USEPA requirements, and all aeration room vents are discharged to a Donaldson EtO Abator catalytic oxidizer emission control device. In compliance with NYDEC requirements, all chamber exhaust vents ("backvents") are discharged to the same Donaldson EtO Abator catalytic oxidizer emission control device.

The gas-sterilization and emission-control equipment consists of the following:

- Eleven Gas Sterilizers, one 26-pallet chamber (3003 cubic feet), four 13-pallet (1333 cubic feet), four 8-pallet (two: 1155 cubic feet; two: 1200 cubic feet), and two 3-pallet (350 cubic feet) capacity, each comprised of a steam-heated sterilization chamber, a recirculating vacuum pump chamber evacuation system, a chamber backvent valve, and a fugitive emissions exhaust hood;

- Five Aeration Rooms, three 48-pallet (11,340 cubic feet), one 685-pallet (189,642 cubic feet), and one 3764 cubic feet capacity, each comprised of a heated aeration room and an aeration room exhaust system.

Sterilizer vacuum pump emissions are controlled by:

- One Ceilcote packed tower acid scrubber, Model SPT-42-120, equipped with a bed of No. 1 Tellerette packing, a 5000 gallon reaction tank/reservoir, a scrubber fluid recirculation pump, and an exhaust blower.

Sterilizer backvent and aeration emissions are controlled by:

- One Donaldson EtO Abator System, operated at approximately 6,000 SCFM, equipped with a prefilter, a steam heater, an exhaust gas heat exchanger, a reactive catalyst bed, and an exhaust blower.

3.0 TESTING

EtO source testing was conducted in accordance with the procedures outlined in CARB Method 431, the USEPA approved alternate method to the procedures listed in 40 CFR, Part 63.365, subpart O. EtO concentration measurement for each test run will be conducted simultaneously at the inlet and outlet of the catalytic oxidizer during chamber backvent, and during a one-hour interval of the 24-hour aeration process. A total of three chamber backvent test runs, and three one-hour aeration test runs, were performed.

During backvent and aeration testing, EtO concentration at the inlet and the outlet of the catalytic oxidizer were determined using direct source sample injection into the gas chromatograph (GC). All backvent and aeration testing was performed using freshly sterilized product. The testing program was conducted in accordance with the procedures outlined in the following sections.

4.0 RULE/COMPLIANCE REQUIREMENTS

The EtO gas-sterilization system at Sterigenics U.S., LLC. was tested to determine compliance with the current federal EPA National Emissions Standard for Hazardous Air Pollutants (NESHAP) for ethylene oxide, and with the requirements specified in the NYDEC Permit. The current testing was performed to demonstrate continued compliance with the following requirements:

- The emissions from the sterilization chamber exhaust vents (backvents) must be discharged to control equipment with an EtO emission-reduction efficiency of at least 99.0% by weight.

- The emissions from the aeration process must be discharged to control equipment with an EtO emission-reduction efficiency of at least 99.0% by weight, or which reduces the EtO concentration at the emission-control outlet to less than 1 ppm.

Testing is required to demonstrate compliance with these requirements. Source testing of the emission-control device is conducted annually.

5.0 TEST METHOD REFERENCE

5.1 INTRODUCTION

EtO source testing was conducted in accordance with the procedures outlined in CARB Method 431, the USEPA approved alternate method to the procedures listed in 40 CFR, Part 63.365, subpart O. EtO concentration measurement for each test run will be conducted simultaneously at the inlet and outlet of the catalytic oxidizer during chamber backvent, and during a one-hour interval of the 24-hour aeration process. A total of three chamber backvent test runs, and three one-hour aeration test runs, were performed.

During backvent and aeration testing, EtO concentration at the inlet and the outlet of the catalytic oxidizer were determined using direct source sample injection into the gas chromatograph (GC). All backvent and aeration testing was performed using freshly sterilized product.

Operation and documentation of process conditions were performed by personnel from Sterigenics using existing monitoring instruments installed by the manufacturer on the equipment to be tested. In accordance with USEPA CFR40, Part 63.364 (c), catalyst bed temperature was recorded, using the lone thermocouple installed by the equipment manufacturer to display the average/representative temperature immediately downstream of the bank of catalyst trays.

5.2 CONTROL EFFICIENCY MEASUREMENT

During backvent and aeration testing, EtO concentration at the inlet and outlet of the catalytic oxidizer were determined using direct source sample injection into the GC. Since the source gas flow is identical at the inlet and outlet of the catalytic oxidizer control-efficiency of EtO during aeration and backvent was calculated by comparing the concentration of EtO vented to the system inlet to the concentration of EtO vented from the system outlet.

CARB Method 431, Appendix A, specifies that catalytic oxidizer emission-control devices may be tested, and control efficiency determined, without volumetric flow measurement as long as the following criteria are met:

1) There is no dilution between the inlet and outlet sampling locations

2) There is identical flow at the inlet and outlet sampling locations, and
3) There is constant flow throughout the duration of the compliance test.

These conditions were all met during the testing performed at Sterigenics. Specifically, condition 2 was met due to the extremely high flow rate of ambient air being drawn through the oxidizer (15,000 CFM) which, when compared to the relatively low flow rate of natural gas to the heater burner, renders the potential contribution of any fuel gas combustion products to the outlet flow rate to be extremely negligible. In addition, emissions testing for combustion products performed on similar gas-fired catalytic oxidizers used to control EtO emissions has demonstrated that the exhaust gas composition at the outlet of the oxidizer contains moisture, oxygen, carbon dioxide, and carbon monoxide at ambient levels, and that any deviations are at low ppmv levels. This is further proof that the potential contribution of any fuel gas combustion products to the outlet flow rate is insignificant.

During the backvent and aeration phases, vented gas was analyzed by an SRI, Model 8610, portable gas chromatograph (GC), equipped with the following: dual, heated sample loops and injectors; dual columns; and dual detectors. A flame ionization detector (FID) was used to quantify inlet EtO concentration, and a photoionization detector (PID) was used to quantify low-level EtO concentration at the emission-control device outlet.

5.3 SAMPLE TRANSPORT

Source gas was pumped to the GC at approximately 1000 cubic centimeters per minute (cc/min) from the sampling ports through two lengths of Teflon® sample line, each with a nominal volume of approximately 75 cubic centimeters (cc) and an outer diameter of 0.25 inch. At the inlet, the sampling port was located in the common backvent/aeration discharge duct, upstream of the oxidizer. At the outlet of the catalytic oxidizer, sampling ports were located in the exhaust stack downstream of the catalyst bed.

5.4 GC INJECTION

Source-gas samples were then injected into the GC which was equipped with two heated sampling loops, each containing a volume of approximately 2cc and maintained at 100 degrees Celsius (C). Injections occurred at approximately five-minute intervals during the aeration-phase testing. Helium was the carrier gas for both the FID and PID.

5.5 GC CONDITIONS

The packed columns for the GC were both operated at 90 degrees C. The columns were stainless steel, 6 feet long, 0.125-inch outer diameter, packed with 1 percent SP-1000 on 60/80 mesh Carbopack B. During the analysis, the FID was operated at 250 degrees C. The support gases for the FID were helium (99.999% pure), hydrogen (99.995% pure) and air (99.9999% pure). Any unused sample gas was vented from the GC system back to the inlet of the control device being tested.

5.6 CALIBRATION STANDARDS

The FID was calibrated for mid-range part-per-million-by-volume (ppmv) level analysis using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

The PID was calibrated for low-range ppmv level analyses using gas proportions similar to the following:

1) 100 ppmv EtO, balance nitrogen
2) 50 ppmv EtO, balance nitrogen (audit gas)
3) 10 ppmv EtO, balance nitrogen
4) 1 ppmv EtO, balance nitrogen

Each of these calibration standards was in a separate, certified manufacturer's cylinder. Copies of the calibration gas laboratory certificates are attached as Appendix I.

5.7 SAMPLING DURATION

Backvent testing was performed in conjunction with normal production operations, during the chamber exhaust venting which is conducted for each sterilization chamber upon conclusion of the sterilization cycle, immediately prior to and during chamber unloading. Backvent sampling duration was 15 minutes for each of the three test runs.

Since aeration is a 24-hour process at this facility, with constant discharge flow from the aeration chambers to the emission-control system, aeration testing consisted of three 1-hour test runs. Each test run was performed with freshly sterilized product in the aeration chambers.

5.8 CONTROL-EFFICIENCY CALCULATIONS

Control efficiency of EtO was calculated for aeration and backvent, using the following CARB-approved equation:

$$\text{Efficiency} = (C_i - C_o / C_i)(100)$$

Which is a mathematical simplification of the following equation from CARB Method 431, with the identical inlet/outlet flow value removed:

$$\text{Efficiency} = (W_i - W_o / W_i)(100)$$

Where:

W_i = Mass flow rate to the control device inlet, pounds, calculated as $(C_i)(F_i)$

Where:

C_i = EtO concentration at the control device inlet

F_i = Flow rate at the control device inlet

W_o = Mass flow rate from the control device outlet, pounds, calculated as $(C_o)(F_o)$

Where:

C_o = EtO concentration at the control device outlet

F_o = Flow rate at the control device outlet

Results of the control-efficiency testing are presented in Section 8.0, and in Tables 1 and 2.

6.0 TEST SCENARIO

The backvent and aeration testing was performed during normal process load conditions. Three backvent and three aeration test runs were conducted in series to verify the performance of the emission-control device. The testing schedule was as follows:

1) Testing equipment was set up and calibrated.
2) Backvent Phase Test Run #1 was conducted with one freshly sterilized production load. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
3) Aeration Phase Test Run #1 was conducted with freshly sterilized product in aeration. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
4) Backvent Phase Test Run #2 was conducted with one freshly sterilized production load. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
5) Aeration Phase Test Run #2 was conducted with freshly sterilized product in aeration. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
6) Backvent Phase Test Run #3 was conducted with one freshly sterilized production load. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
7) Aeration Phase Test Run #3 was conducted with freshly sterilized product in aeration. Sampling was performed at the inlet and the outlet of the catalytic oxidizer.
8) Post calibration check was performed, testing equipment was packed.

7.0 QA/QC

7.1 FIELD TESTING QUALITY ASSURANCE

At the beginning of the test, the sampling system was leak checked at a vacuum of 15 inches of mercury. The sampling system was considered leak free when the flow indicated by the rotameters fell to zero.

At the beginning of the test, a system blank was analyzed to ensure that the sampling system was free of EtO. Ambient air was introduced at the end of the sample line and drawn through the sampling system line to the GC for analysis. The resulting chromatogram also provided a background level for non-EtO components (i.e. ambient air, carbon dioxide, water vapor) which are present in the source gas stream due to the ambient dilution air which is drawn into the emission-control device, and due to the destruction of EtO by the emission-control device which produces carbon dioxide and water vapor. This chromatogram, designated AMB, is included with the calibration data in Appendix A.

7.2 CALIBRATION PROCEDURES

The GC system was calibrated at the beginning and conclusion of each day's testing. Using the Peaksimple II analytical software, a calibration curve was constructed for each detector. A gas cylinder of similar composition as the calibration gases, but certified by a separate supplier, was used to verify calibration gas composition and GC performance.

All calibration gases and support gases used were of the highest purity and quality available. A copy of the laboratory certification for each calibration gas is attached as Appendix I.

8.0 TEST RESULTS

The catalytic oxidizer was found to have an average EtO control efficiency of 99.80 percent for backvent, and an average EtO control efficiency of 99.92 percent for aeration. In accordance with state and federal requirements, backvent and aeration discharge streams must be vented to control equipment with an EtO emission-reduction efficiency of at least 99 percent by weight. The catalytic oxidizer met this requirement.

The test results are summarized in Tables 1 and 2. These tables include results for EtO control efficiency of the emission-control device. Chromatograms and chromatographic supporting data are attached as Appendices A through G. Copies of field data and calculation worksheets are attached as Appendix H.

TABLES

TABLE 1
ETHYLENE OXIDE CONTROL EFFICIENCY - BACKVENT
OF AN ETHYLENE OXIDE EMISSION CONTROL DEVICE
OPERATED BY STERIGENICS U.S., LLC.
IN QUEENSBURY, NEW YORK
ON DECEMBER 12, 2019

RUN NUMBER	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
1(3)	1240	123	0.585	99.5244
1	1241	89.6	0.626	99.3013
1	1242	64.7	0.283	99.5626
1	1243	61.1	0.325	99.4681
1	1245	60.3	0.286	99.5257
1	1246	59.7	0.280	99.5310
1	1247	59.0	0.103	99.8254
1	1249	58.6	0.230	99.6075
1	1250	58.6	0.301	99.4863
1	1251	56.9	0.304	99.4657
1	1252	57.5	0.202	99.6487
1	1253	56.8	0.257	99.5475
2(4)	1357	39.8	0.012	99.9698
2	1358	62.1	0.104	99.8325
2	1359	38.6	0.139	99.6399
2	1401	32.2	0.097	99.6988
2	1402	33.1	0.012	99.9637
2	1403	35.5	0.012	99.9662
2	1404	36.5	0.012	99.9671
2	1405	37.9	0.012	99.9683
2	1406	39.6	0.012	99.9697
2	1408	41.2	0.012	99.9709
2	1409	42.6	0.012	99.9718
2	1410	43.3	0.012	99.9723
3(5)	1517	114	0.224	99.8035
3	1518	35.5	0.012	99.9662
3	1519	33.3	0.012	99.9640
3	1520	30.9	0.012	99.9612
3	1521	34.6	0.012	99.9653
3	1523	33.7	0.012	99.9644
3	1524	34.1	0.012	99.9648
3	1525	33.0	0.012	99.9636
3	1526	33.0	0.012	99.9636
3	1527	33.6	0.012	99.9643
3	1529	32.4	0.012	99.9630
3	1530	33.2	0.012	99.9639
TIME-WEIGHTED AVERAGE:		**49.15**	**0.1274**	**99.7998**
		NYDEQ REQUIRED CONTROL EFFICIENCY:		**99%**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.013 ppm is the quantification limit for the detector used at the outlet.
(3) - Backvent Phase Test Run #1 started at 12:39, ended at 12:54.
(4) - Backvent Phase Test Run #2 started at 13:56, ended at 14:11.
(5) - Backvent Phase Test Run #3 started at 15:16, ended at 15:31.
(6) - During backvent testing, the average recorded catalyst bed temperature was 288 deg F

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TABLE 2
ETHYLENE OXIDE CONTROL EFFICIENCY - AERATION
OF AN ETHYLENE OXIDE EMISSION CONTROL DEVICE
OPERATED BY STERIGENICS U.S., LLC.
IN QUEENSBURY, NEW YORK
ON DECEMBER 12, 2019

RUN NUMBER	INJECTION TIME	INLET ETO CONC. (PPM)(1)	OUTLET ETO CONC. (PPM)(2)	ETO CONTROL EFFICIENCY
1(3)	1256	55.2	0.281	99.4909
1	1301	54.5	0.169	99.6899
1	1306	54.4	0.185	99.6599
1	1311	53.7	0.286	99.4674
1	1316	44.7	0.012	99.9732
1	1321	45.0	0.012	99.9733
1	1326	44.5	0.012	99.9730
1	1331	43.6	0.012	99.9725
1	1336	42.9	0.012	99.9720
1	1341	41.9	0.012	99.9714
1	1346	41.8	0.012	99.9713
1	1351	41.3	0.012	99.9709
2(4)	1413	40.8	0.012	99.9706
2	1418	39.5	0.012	99.9696
2	1423	38.4	0.012	99.9688
2	1428	38.8	0.012	99.9691
2	1433	38.7	0.012	99.9690
2	1438	38.6	0.012	99.9689
2	1443	38.3	0.012	99.9687
2	1448	38.3	0.012	99.9687
2	1453	40.0	0.012	99.9700
2	1458	39.8	0.012	99.9698
2	1503	39.4	0.012	99.9695
2	1508	38.9	0.012	99.9692
3(5)	1533	33.0	0.012	99.9636
3	1538	32.8	0.012	99.9634
3	1543	32.1	0.012	99.9626
3	1548	31.7	0.012	99.9621
3	1553	30.8	0.012	99.9610
3	1558	31.6	0.012	99.9620
3	1603	31.1	0.012	99.9614
3	1608	31.4	0.012	99.9618
3	1613	31.2	0.012	99.9615
3	1618	31.1	0.012	99.9614
3	1623	34.0	0.012	99.9647
3	1628	33.0	0.012	99.9636
TIME-WEIGHTED AVERAGE:		**39.36**	**0.0363**	**99.9241**
			NYDEQ REQUIRED CONTROL EFFICIENCY:	**99%**

Notes:
(1) - PPM = parts per million by volume
(2) - 0.013 ppm is the quantification limit for the detector used at the outlet.
(3) - Aeration Phase Test Run #1 started at 12:54, ended at 13:54.
(4) - Aeration Phase Test Run #2 started at 14:11, ended at 15:11.
(5) - Aeration Phase Test Run #3 started at 15:31, ended at 16:31.
(6) - During aeration testing, the average recorded catalyst bed temperature was 288 deg F

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APPENDICES

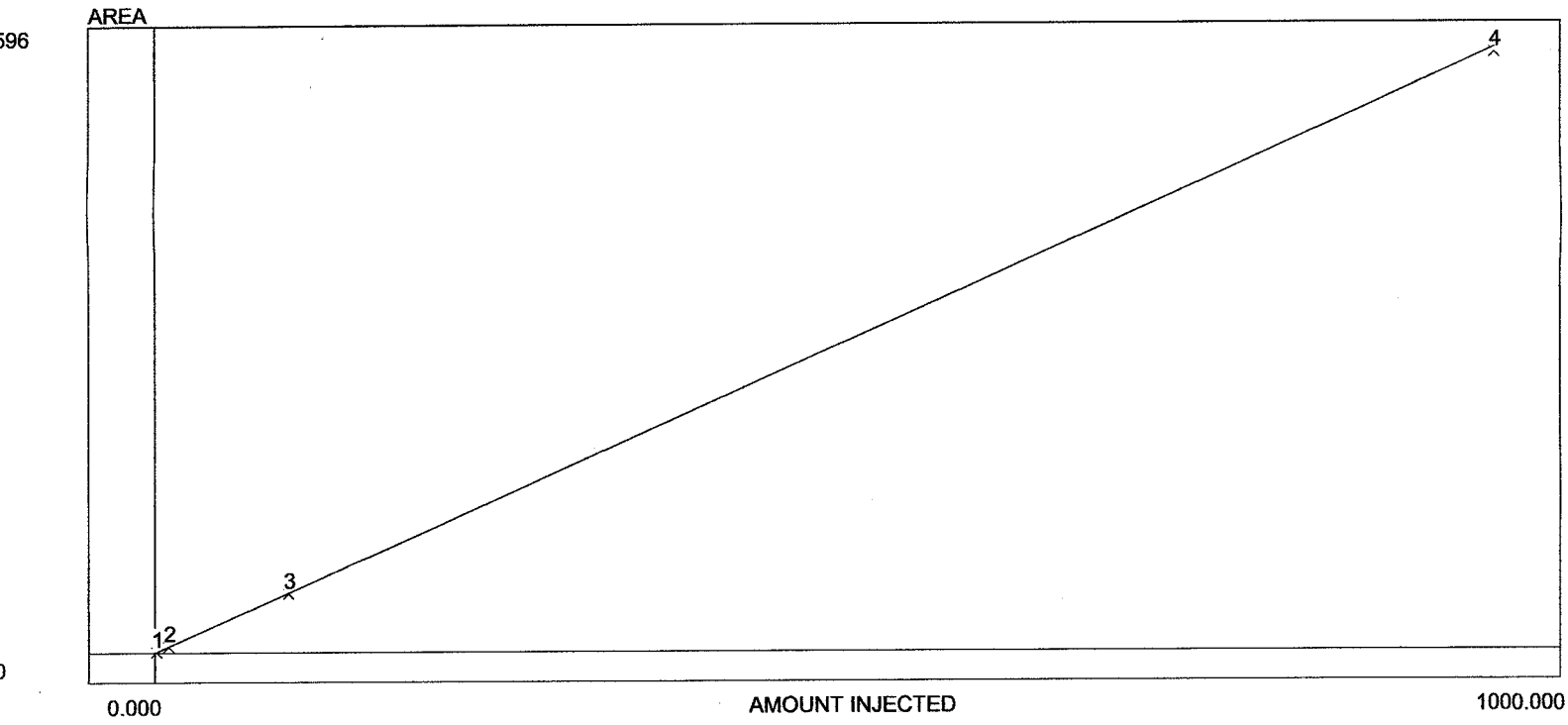
APPENDIX A

Calibration Data

Component file: eto1-100.cpt

Peak	Name	Start	End	Calibration	Int.Std	Units
1	Dead Vol / Air	0.000	0.280		0.000	
2	Ambient H2O	0.280	0.400		0.000	
3	Ethylene Oxide	0.400	0.530	C:\peak454-64bit\0.000\1Sppm\B2019.CAL		
4	Acetaldehyde	0.530	1.000		0.000	

Calibration file: C:\peak454-64bitWin10\1SterQB2019.CAL



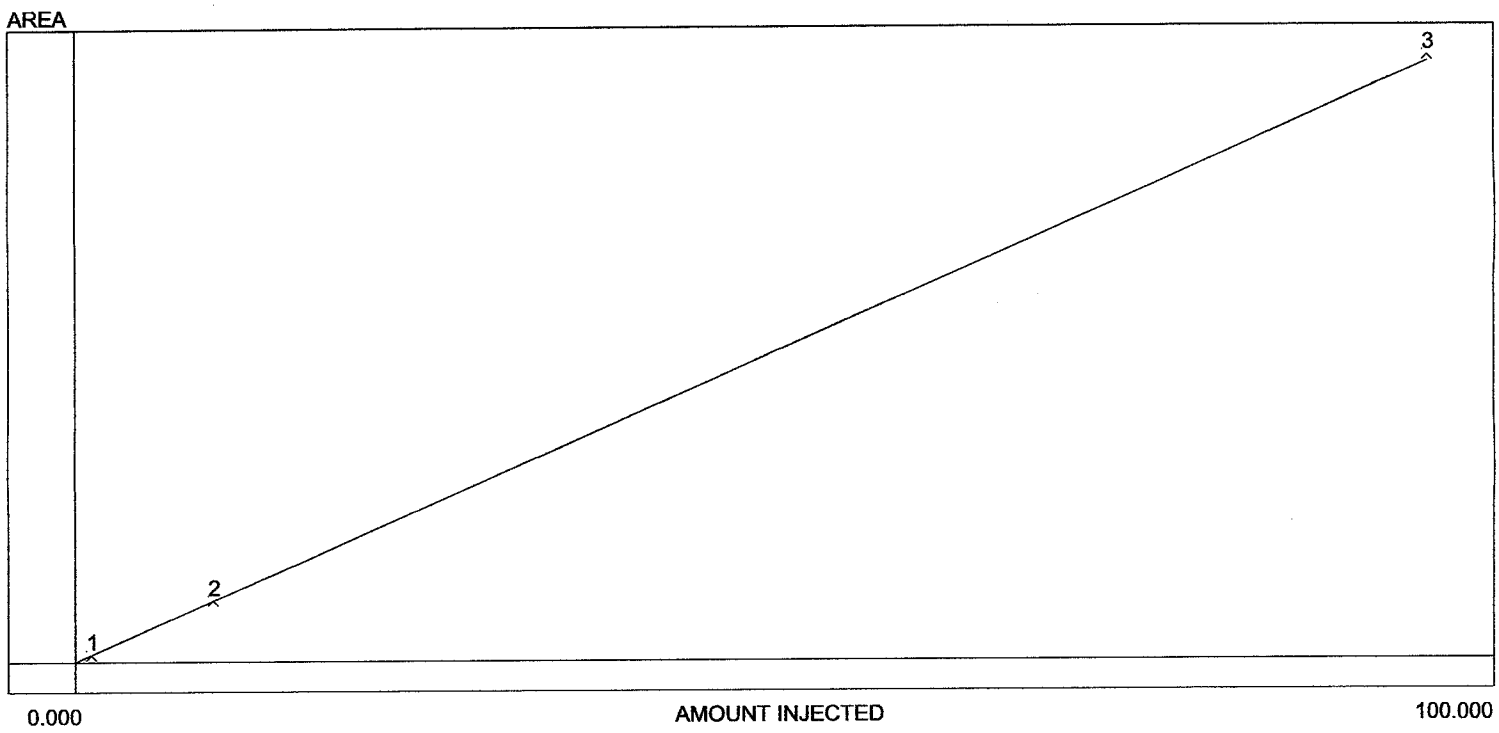
Avg slope of curve: 0.60
Y-axis intercept: 0.00
Linearity: 1.00
Number of levels: 4
SD/rel SD of CF's: 0.0/1.9
Y=0.6007X
R2: 1.0000
Last calibrated: Thu Dec 12 09:10:25 2019

Lvl.	Area/ht.	Amount	CF	Current	Previous #1	Previous #2
1	0.729	1.180	0.618	0.729	N/A	N/A
2	6.060	10.200	0.594	6.060	N/A	N/A
3	59.530	100.000	0.595	59.530	N/A	N/A
4	595.700	1000.000	0.596	595.700	N/A	N/A

Component file: eto2-100.cpt

Peak	Name	Start	End	Calibration	Int.Std	Units
1	Dead Vol / Air	0.000	0.280		0.000	
2	Ambient H2O	0.280	0.400		0.000	
3	Ethylene Oxide	0.400	0.510	C:\peak454-64bit\0.000\2Sppm\B2019.CAL		
4	Acetaldehyde	0.510	1.000		0.000	

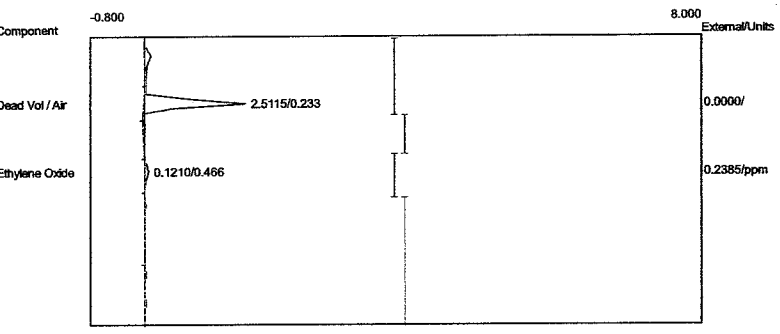
Calibration file: C:\peak454-64bitWin10\2SterQB2019.CAL



Avg slope of curve: 2.07
Y-axis intercept: 0.00
Linearity: 1.00
Number of levels: 3
SD/rel SD of CF's: 0.0/1.8
Y=2.0689X
R2: 1.0000
Last calibrated: Thu Dec 12 08:50:49 2019

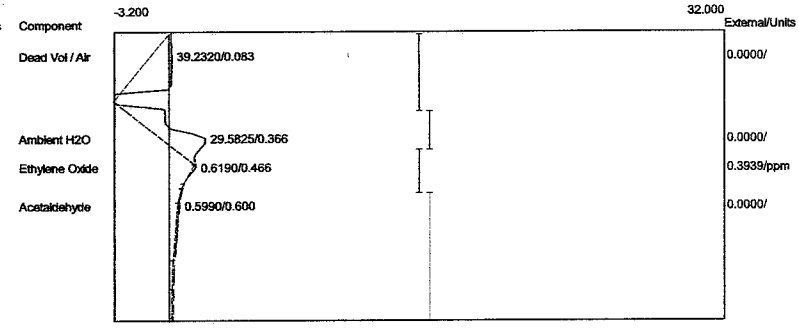
Lvl.	Area/ht.	Amount	CF	Current	Previous #1	Previous #2
1	2.390	1.180	2.025	2.390	N/A	N/A
2	21.330	10.200	2.091	21.330	N/A	N/A
3	209.000	100.000	2.090	209.000	N/A	N/A

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:01:37
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-Amb.CHR (c:\peak359)
Sample: Ambient Background
Operator: D. Kremer



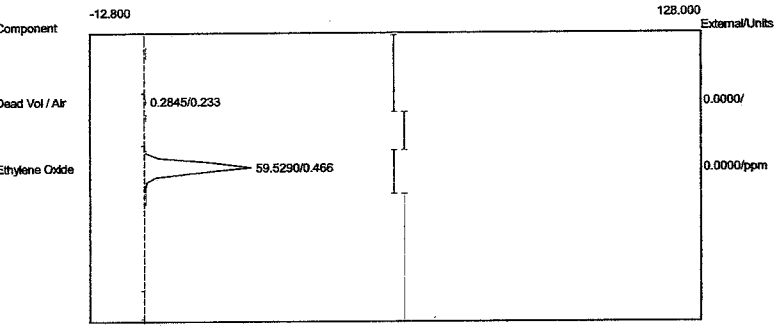
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	2.5115	0.0000	
Ethylene Oxide	0.466	0.1210	0.2385	ppm
		2.6325	0.2385	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:01:37
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-Amb.CHR (c:\peak359)
Sample: Ambient Background
Operator: D. Kremer



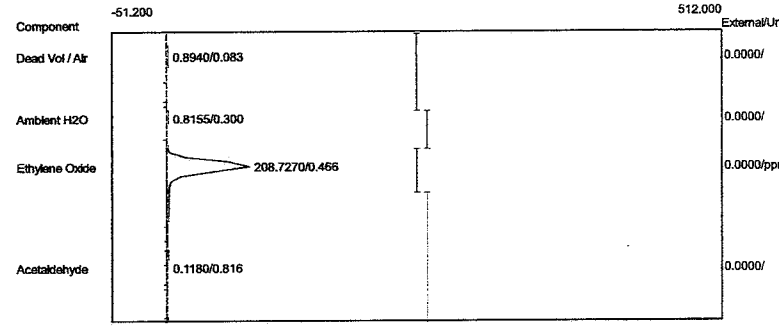
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	39.2320	0.0000	
Ambient H2O	0.366	29.5825	0.0000	
Ethylene Oxide	0.466	0.6190	0.3939	ppm
Acetaldehyde	0.600	0.5990	0.0000	
		70.0325	0.3939	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:04:43
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
ntrol filename: DEFAULT.CON
Data file: 1SterQB2019-C01.CHR (c:\peak359)
Sample: 100 ppm std
Operator: D. Kremer



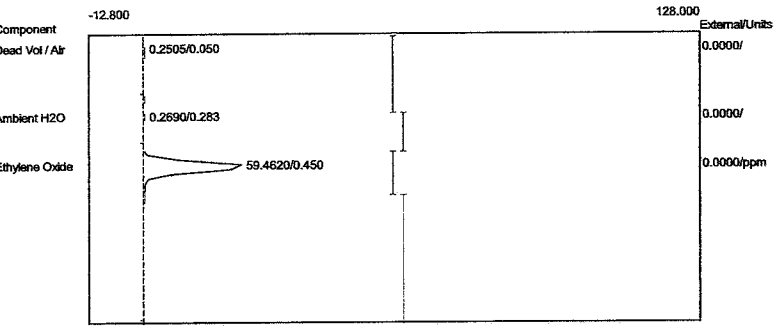
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	0.2845	0.0000	
Ethylene Oxide	0.466	59.5290	0.0000	ppm
		59.8135	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:04:43
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
ntrol filename: DEFAULT.CON
Data file: 2SterQB2019-C01.CHR (c:\peak359)
Sample: 100 ppm std
Operator: D. Kremer



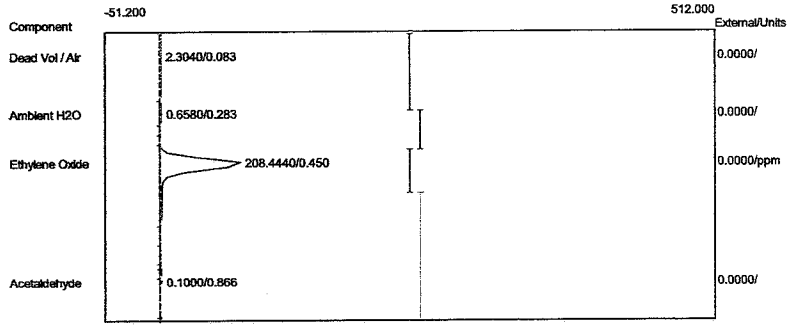
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	0.8940	0.0000	
Ambient H2O	0.300	0.8155	0.0000	
Ethylene Oxide	0.466	208.7270	0.0000	ppm
Acetaldehyde	0.816	0.1180	0.0000	
		210.5545	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:06:42
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
ntrol filename: DEFAULT.CON
Data file: 1SterQB2019-C02.CHR (c:\peak359)
Sample: 100 ppm std
Operator: D. Kremer



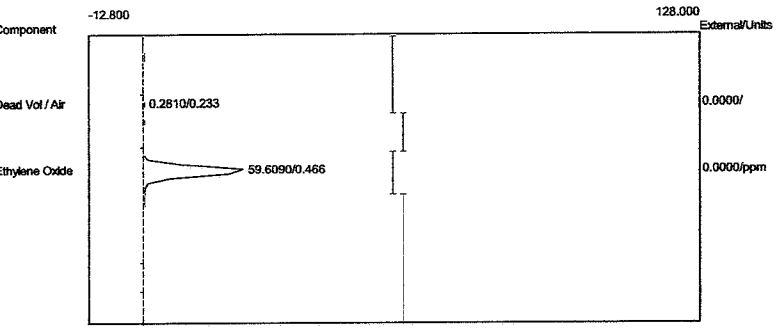
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	0.2505	0.0000	
Ambient H2O	0.283	0.2690	0.0000	
Ethylene Oxide	0.450	59.4620	0.0000	ppm
		59.9815	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:06:42
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
ontrol filename: DEFAULT.CON
Data file: 2SterQB2019-C02.CHR (c:\peak359)
Sample: 100 ppm std
Operator: D. Kremer



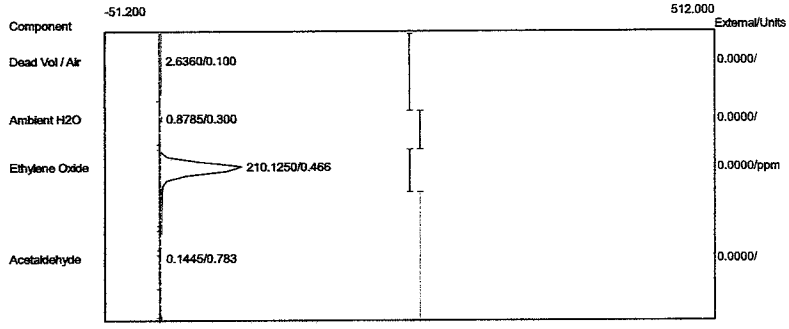
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	2.3040	0.0000	
Ambient H2O	0.283	0.6580	0.0000	
Ethylene Oxide	0.450	208.4440	0.0000	ppm
Acetaldehyde	0.866	0.1000	0.0000	
		211.5060	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:09:54
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
ntrol filename: DEFAULT.CON
Data file: 1SterQB2019-C03.CHR (c:\peak359)
Sample: 100 ppm std
Operator: D. Kremer



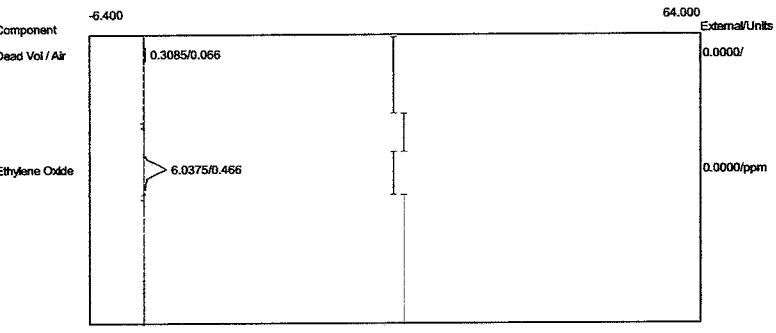
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	0.2810	0.0000	
Ethylene Oxide	0.466	59.6090	0.0000	ppm
		59.8900	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:09:54
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
ontrol filename: DEFAULT.CON
Data file: 2SterQB2019-C03.CHR (c:\peak359)
Sample: 100 ppm std
Operator: D. Kremer



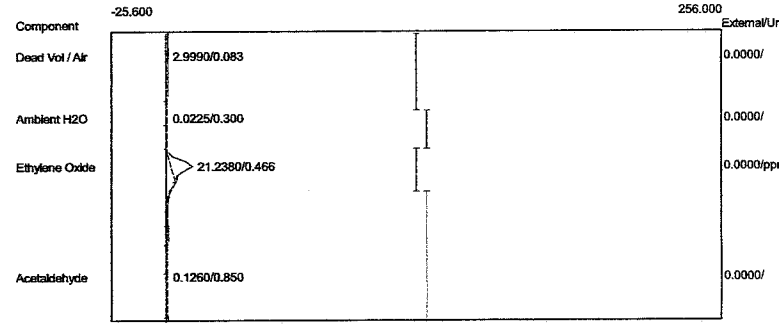
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	2.6360	0.0000	
Ambient H2O	0.300	0.8785	0.0000	
Ethylene Oxide	0.466	210.1250	0.0000	ppm
Acetaldehyde	0.783	0.1445	0.0000	
		213.7840	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:15:07
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
ntrol filename: DEFAULT.CON
Data file: 1SterQB2019-C04.CHR (c:\peak359)
Sample: 10.2 ppm std
Operator: D. Kremer



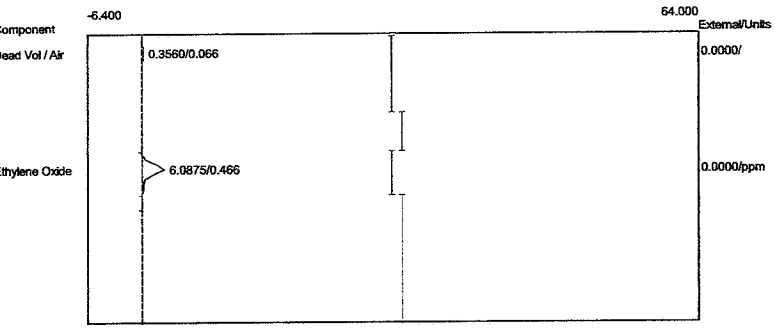
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	0.3085	0.0000	
Ethylene Oxide	0.466	6.0375	0.0000	ppm
		6.3460	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:15:07
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
ntrol filename: DEFAULT.CON
Data file: 2SterQB2019-C04.CHR (c:\peak359)
Sample: 10.2 ppm std
Operator: D. Kremer



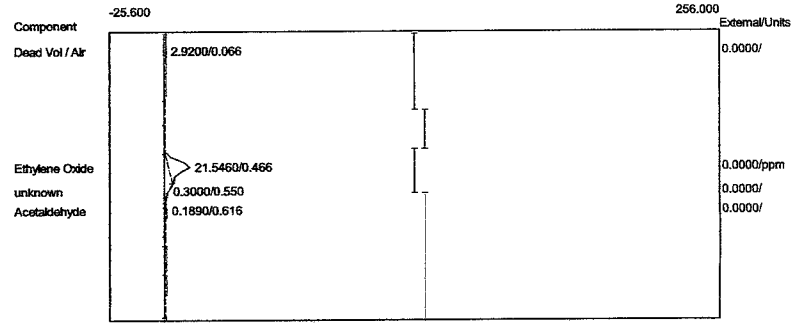
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	2.9990	0.0000	
Ambient H2O	0.300	0.0225	0.0000	
Ethylene Oxide	0.466	21.2380	0.0000	ppm
Acetaldehyde	0.850	0.1260	0.0000	
		24.3855	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:20:27
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
ntrol filename: DEFAULT.CON
Data file: 1SterQB2019-C05.CHR (c:\peak359)
Sample: 10.2 ppm std
Operator: D. Kremer



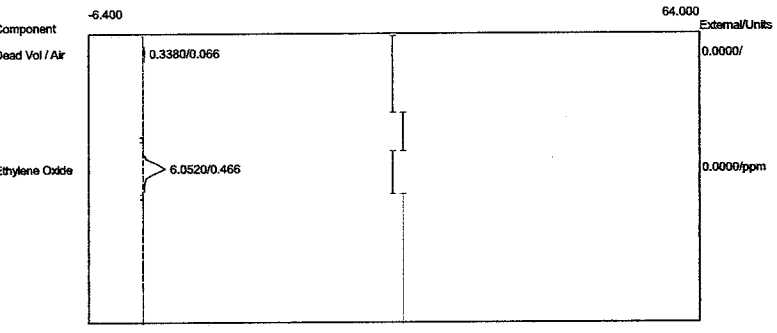
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	0.3560	0.0000	
Ethylene Oxide	0.466	6.0875	0.0000	ppm
		6.4435	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:20:27
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
ontrol filename: DEFAULT.CON
Data file: 2SterQB2019-C05.CHR (c:\peak359)
Sample: 10.2 ppm std
Operator: D. Kremer



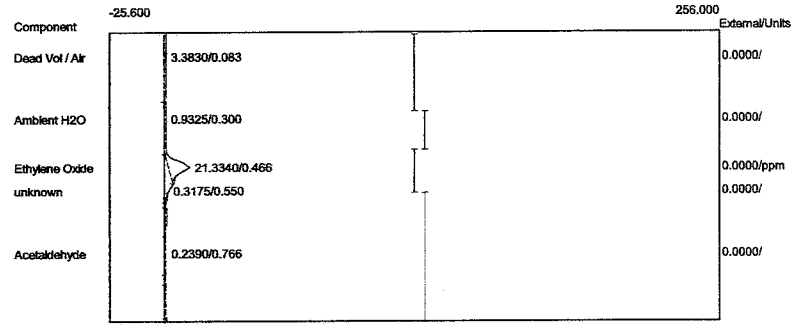
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	2.9200	0.0000	
Ethylene Oxide	0.466	21.5460	0.0000	ppm
Acetaldehyde	0.616	0.1890	0.0000	
		24.6550	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:25:52
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
ntrol filename: DEFAULT.CON
Data file: 1SterQB2019-C06.CHR (c:\peak359)
Sample: 10.2 ppm std
Operator: D. Kremer



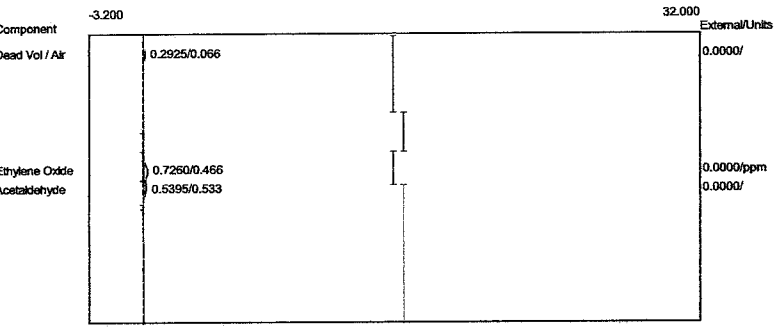
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	0.3380	0.0000	
Ethylene Oxide	0.466	6.0520	0.0000	ppm
		6.3900	0.0000	

Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:25:52
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
ontrol filename: DEFAULT.CON
Data file: 2SterQB2019-C06.CHR (c:\peak359)
Sample: 10.2 ppm std
Operator: D. Kremer



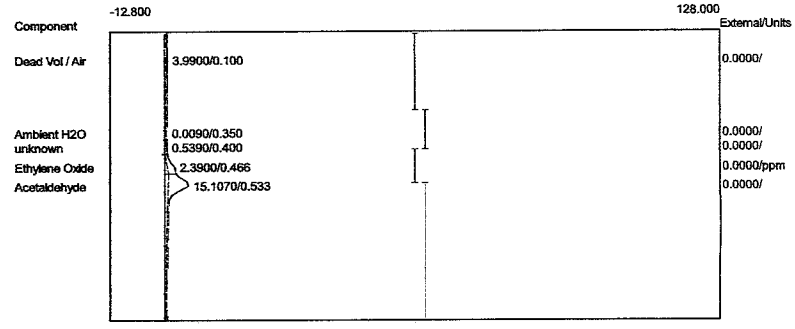
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	3.3830	0.0000	
Ambient H2O	0.300	0.9325	0.0000	
Ethylene Oxide	0.466	21.3340	0.0000	ppm
Acetaldehyde	0.766	0.2390	0.0000	
		25.8885	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:31:12
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
ntrol filename: DEFAULT.CON
Data file: 1SterQB2019-C07.CHR (c:\peak359)
Sample: 1.18 ppm std
Operator: D. Kremer



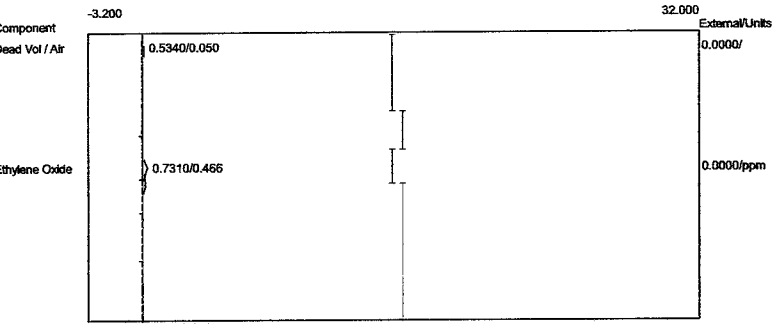
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	0.2925	0.0000	
Ethylene Oxide	0.466	0.7260	0.0000	ppm
Acetaldehyde	0.533	0.5395	0.0000	
		1.5580	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:31:12
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
ontrol filename: DEFAULT.CON
Data file: 2SterQB2019-C07.CHR (c:\peak359)
Sample: 1.18 ppm std
Operator: D. Kremer



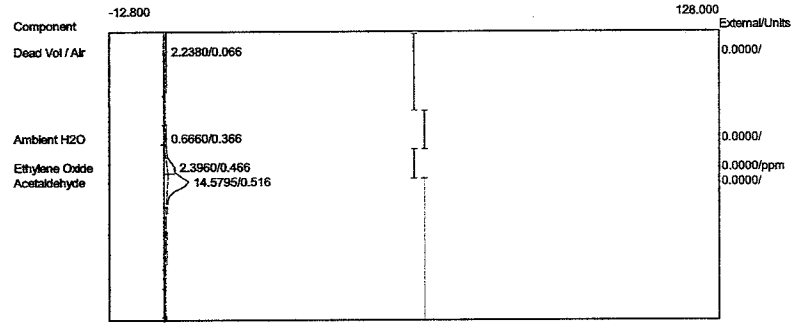
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	3.9900	0.0000	
Ambient H2O	0.350	0.0090	0.0000	
Ethylene Oxide	0.466	2.3900	0.0000	ppm
Acetaldehyde	0.533	15.1070	0.0000	
		21.4960	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:34:28
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
ntrol filename: DEFAULT.CON
Data file: 1SterQB2019-C08.CHR (c:\peak359)
Sample: 1.18 ppm std
Operator: D. Kremer



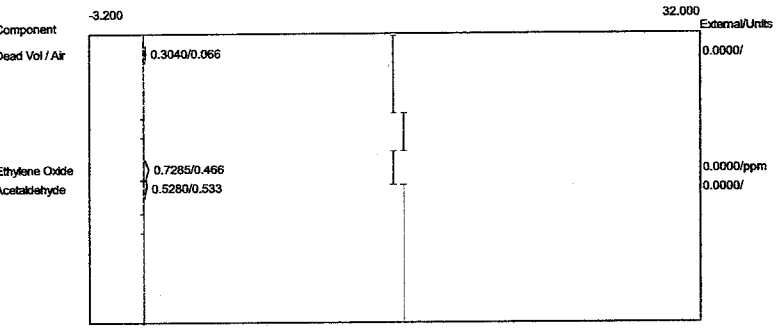
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	0.5340	0.0000	
Ethylene Oxide	0.466	0.7310	0.0000	ppm
		1.2650	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:34:28
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
ontrol filename: DEFAULT.CON
Data file: 2SterQB2019-C08.CHR (c:\peak359)
Sample: 1.18 ppm std
Operator: D. Kremer



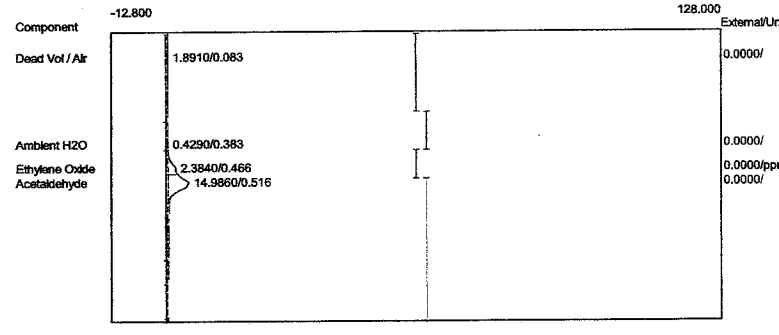
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	2.2380	0.0000	
Ambient H2O	0.366	0.6660	0.0000	
Ethylene Oxide	0.466	2.3960	0.0000	ppm
Acetaldehyde	0.516	14.5795	0.0000	
		19.8795	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:41:51
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
ntrol filename: DEFAULT.CON
Data file: 1SterQB2019-C09.CHR (c:\peak359)
Sample: 1.18 ppm std
Operator: D. Kremer



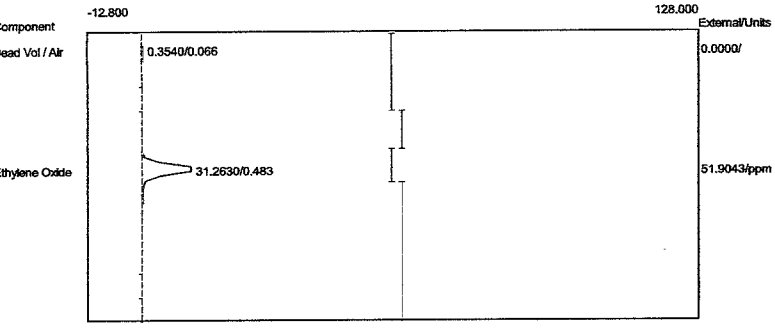
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	0.3040	0.0000	
Ethylene Oxide	0.466	0.7285	0.0000	ppm
Acetaldehyde	0.533	0.5280	0.0000	
		1.5605	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:41:51
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
ontrol filename: DEFAULT.CON
Data file: 2SterQB2019-C09.CHR (c:\peak359)
Sample: 1.18 ppm std
Operator: D. Kremer



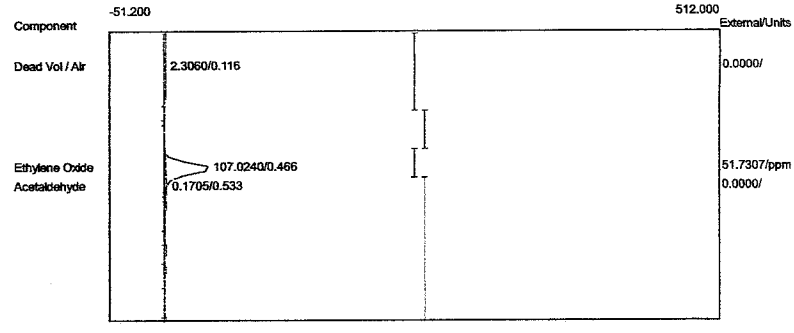
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	1.8910	0.0000	
Ambient H2O	0.383	0.4290	0.0000	
Ethylene Oxide	0.466	2.3840	0.0000	ppm
Acetaldehyde	0.516	14.9860	0.0000	
		19.6900	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:49:49
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
ntrol filename: DEFAULT.CON
Data file: 1SterQB2019-C10.CHR (c:\peak359)
Sample: 52.0 ppm std
Operator: D. Kremer



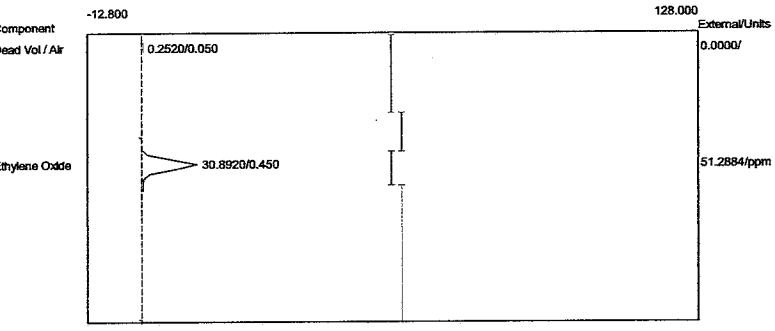
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	0.3540	0.0000	
Ethylene Oxide	0.483	31.2630	51.9043	ppm
		31.6170	51.9043	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:49:49
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
ontrol filename: DEFAULT.CON
Data file: 2SterQB2019-C10.CHR (c:\peak359)
Sample: 52.0 ppm std
Operator: D. Kremer



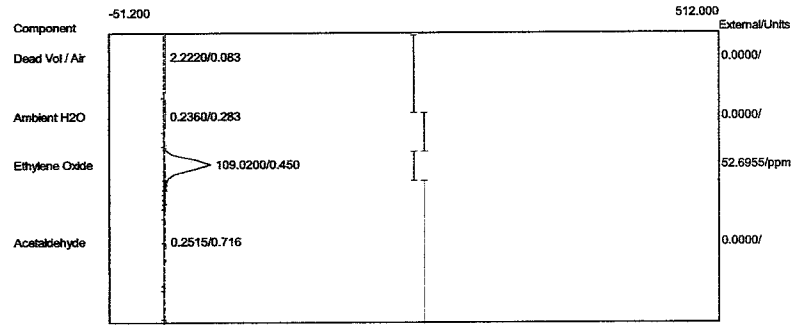
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	2.3060	0.0000	
Ethylene Oxide	0.466	107.0240	51.7307	ppm
Acetaldehyde	0.533	0.1705	0.0000	
		109.5005	51.7307	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:54:29
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
ntrol filename: DEFAULT.CON
Data file: 1SterQB2019-C11.CHR (c:\peak359)
Sample: 52.0 ppm std
Operator: D. Kremer
Comments: Sample Line Bias Cal



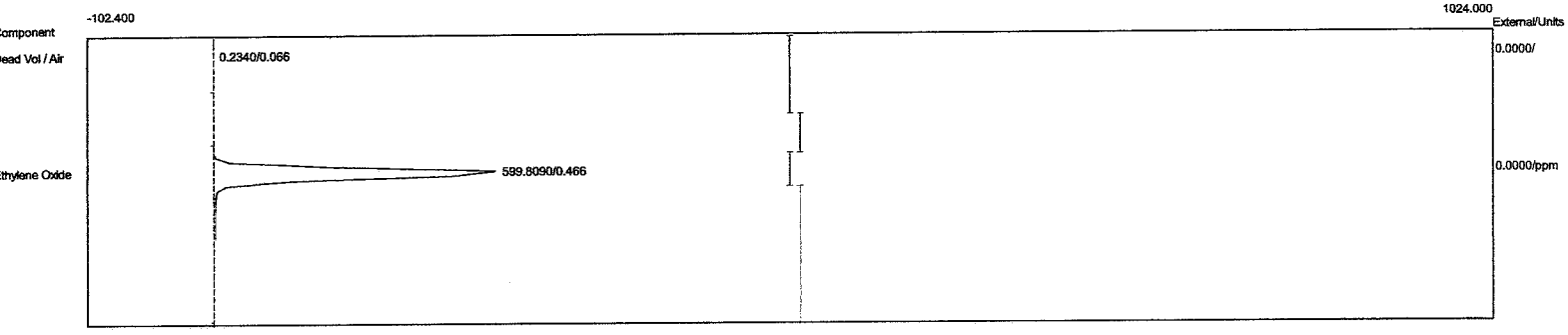
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	0.2520	0.0000	
Ethylene Oxide	0.450	30.8920	51.2884	ppm
		31.1440	51.2884	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 08:54:29
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
ontrol filename: DEFAULT.CON
Data file: 2SterQB2019-C11.CHR (c:\peak359)
Sample: 52.0 ppm std
Operator: D. Kremer
Comments: Sample Line Bias Cal



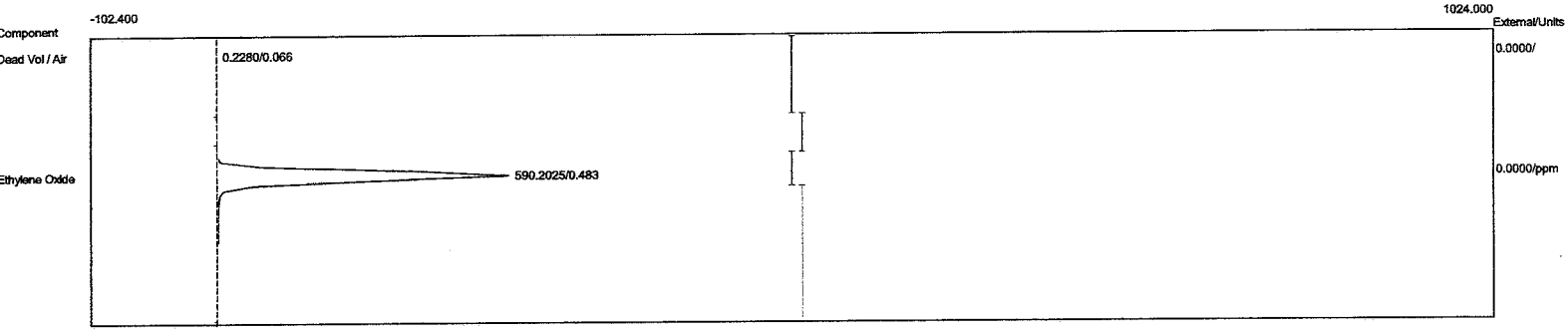
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	2.2220	0.0000	
Ambient H2O	0.283	0.2360	0.0000	
Ethylene Oxide	0.450	109.0200	52.6955	ppm
Acetaldehyde	0.716	0.2515	0.0000	
		111.7295	52.6955	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 09:03:41
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
ntrol filename: DEFAULT.CON
Data file: 1SterQB2019-C12.CHR (c:\peak359)
Sample: 1000 ppm std
Operator: D. Kremer



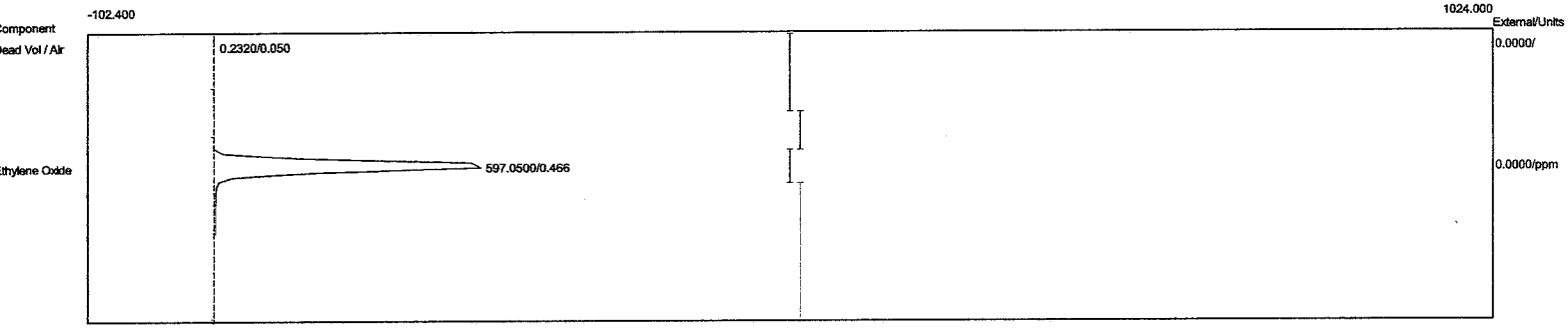
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	0.2340	0.0000	
Ethylene Oxide	0.466	599.8090	0.0000	ppm
		600.0430	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 09:04:59
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
ntrol filename: DEFAULT.CON
Data file: 1SterQB2019-C13.CHR (c:\peak359)
Sample: 1000 ppm std
Operator: D. Kremer



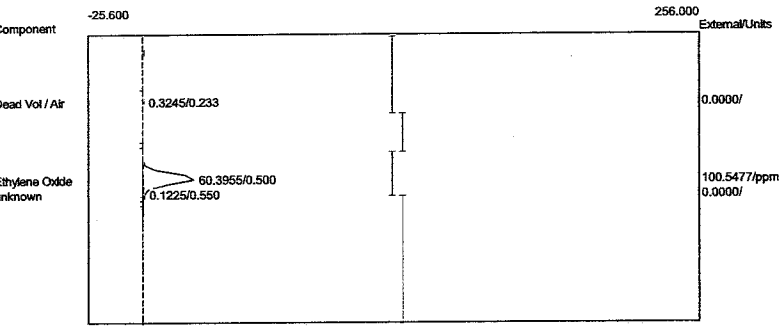
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	0.2280	0.0000	
Ethylene Oxide	0.483	590.2025	0.0000	ppm
		590.4305	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PreCal
Analysis date: 12/12/2019 09:06:34
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
ntrol filename: DEFAULT.CON
Data file: 1SterQB2019-C14.CHR (c:\peak359)
Sample: 1000 ppm std
Operator: D. Kremer



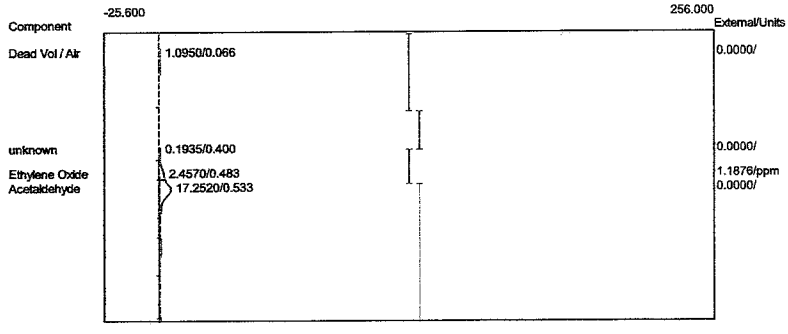
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	0.2320	0.0000	
Ethylene Oxide	0.466	597.0500	0.0000	ppm
		597.2820	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PostCal
Analysis date: 12/12/2019 16:40:21
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-C13.CHR (c:\peak359)
Sample: 100 ppm std
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	0.3245	0.0000	
Ethylene Oxide	0.500	60.3955	100.5477	ppm
		60.7200	100.5477	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: PostCal
Analysis date: 12/12/2019 16:34:22
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-C12.CHR (c:\peak359)
Sample: 1.18 ppm std
Operator: D. Kremer

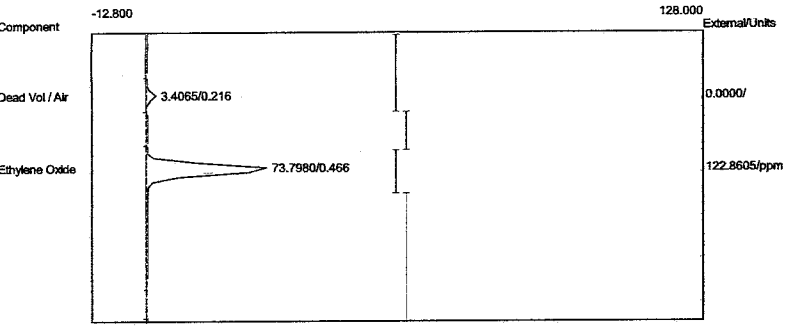


Component	Retention	Area	External	Units
Dead Vol / Air	0.066	1.0950	0.0000	
Ethylene Oxide	0.483	2.4570	1.1876	ppm
Acetaldehyde	0.533	17.2520	0.0000	
		20.8040	1.1876	

APPENDIX B

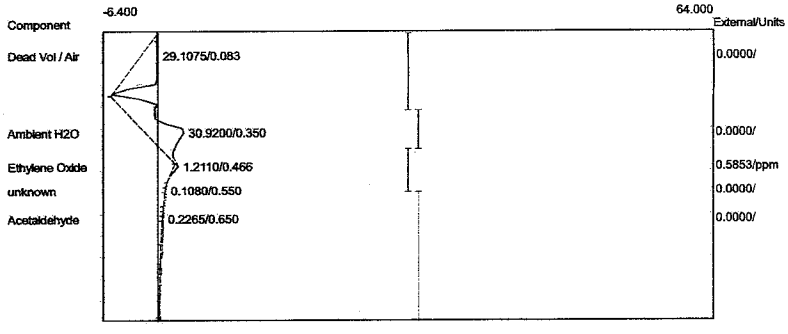
Run #1 Chromatograms – Backvent

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:40:23
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1B01.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



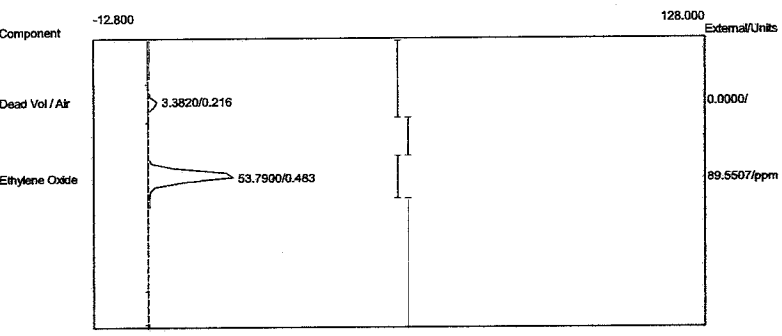
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.4065	0.0000	
Ethylene Oxide	0.466	73.7980	122.8605	ppm
		77.2045	122.8605	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:40:23
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1B01.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



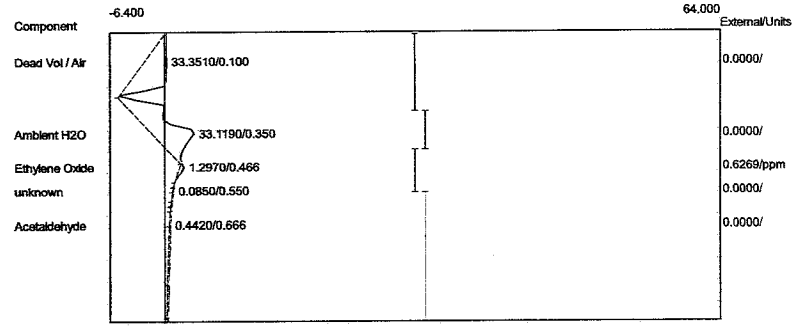
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	29.1075	0.0000	
Ambient H2O	0.350	30.9200	0.0000	
Ethylene Oxide	0.466	1.2110	0.5853	ppm
Acetaldehyde	0.650	0.2265	0.0000	
		61.4650	0.5853	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:41:38
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1B02.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



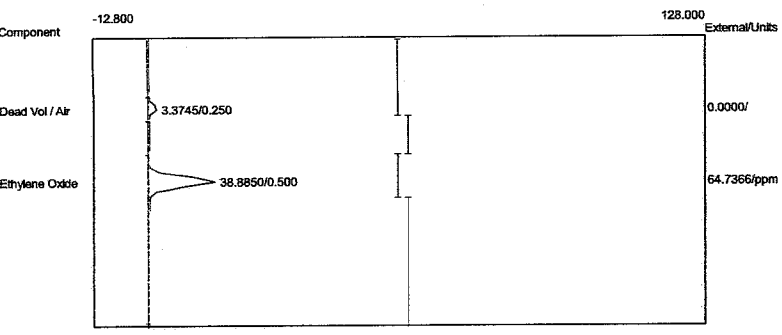
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.3820	0.0000	
Ethylene Oxide	0.483	53.7900	89.5507	ppm
		57.1720	89.5507	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:41:38
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1B02.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



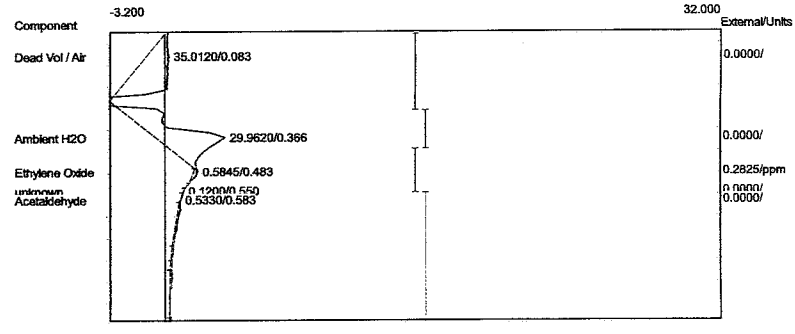
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	33.3510	0.0000	
Ambient H2O	0.350	33.1190	0.0000	
Ethylene Oxide	0.466	1.2970	0.6269	ppm
Acetaldehyde	0.666	0.4420	0.0000	
		68.2090	0.6269	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:42:52
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1B03.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



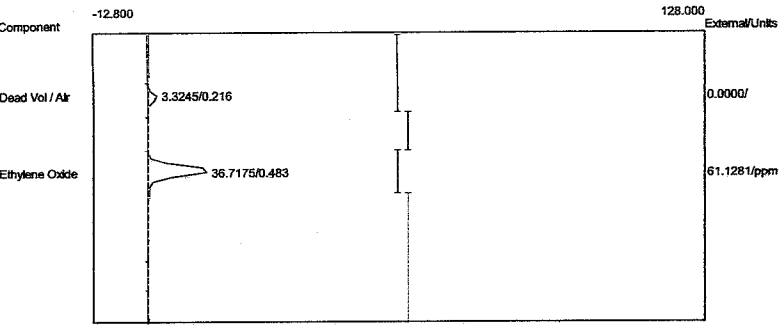
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	3.3745	0.0000	
Ethylene Oxide	0.500	38.8850	64.7366	ppm
		42.2595	64.7366	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:42:52
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1B03.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



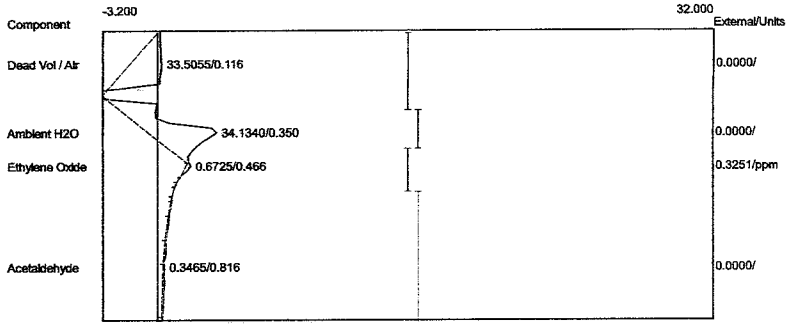
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	35.0120	0.0000	
Ambient H2O	0.366	29.9620	0.0000	
Ethylene Oxide	0.483	0.5845	0.2825	ppm
Acetaldehyde	0.583	0.5330	0.0000	
		66.0915	0.2825	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:44:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1B04.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



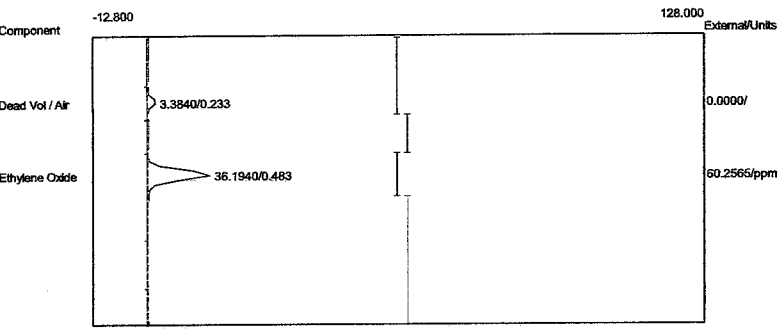
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.3245	0.0000	
Ethylene Oxide	0.483	36.7175	61.1281	ppm
		40.0420	61.1281	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:44:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1B04.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



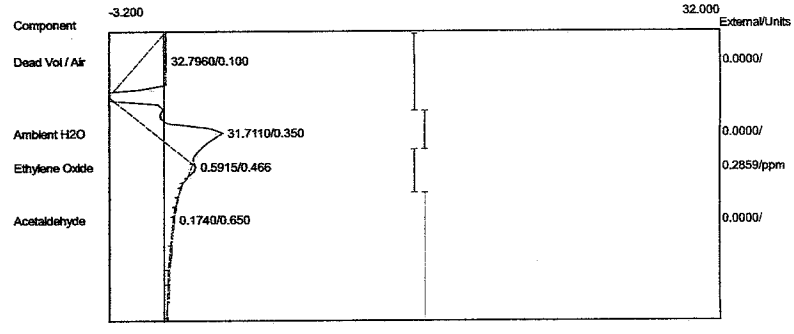
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	33.5055	0.0000	
Ambient H2O	0.350	34.1340	0.0000	
Ethylene Oxide	0.466	0.6725	0.3251	ppm
Acetaldehyde	0.816	0.3465	0.0000	
		68.6585	0.3251	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:45:18
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1B05.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



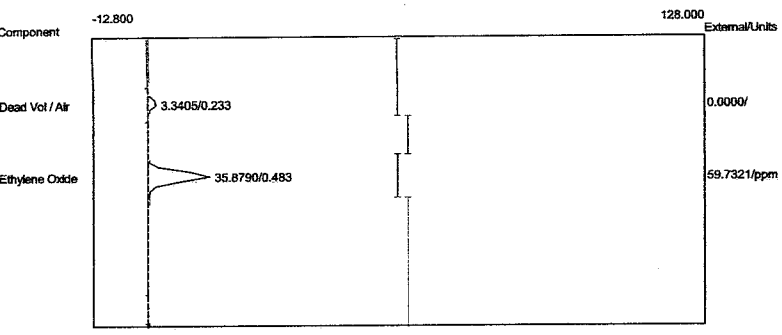
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3840	0.0000	
Ethylene Oxide	0.483	36.1940	60.2565	ppm
		39.5780	60.2565	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:45:18
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1B05.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



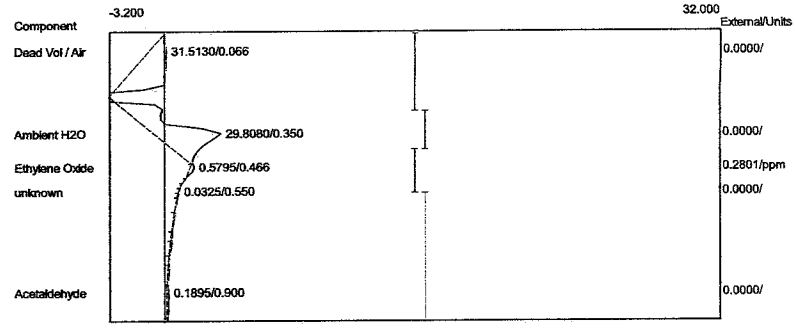
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	32.7960	0.0000	
Ambient H2O	0.350	31.7110	0.0000	
Ethylene Oxide	0.466	0.5915	0.2859	ppm
Acetaldehyde	0.650	0.1740	0.0000	
		65.2725	0.2859	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:46:35
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1B06.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



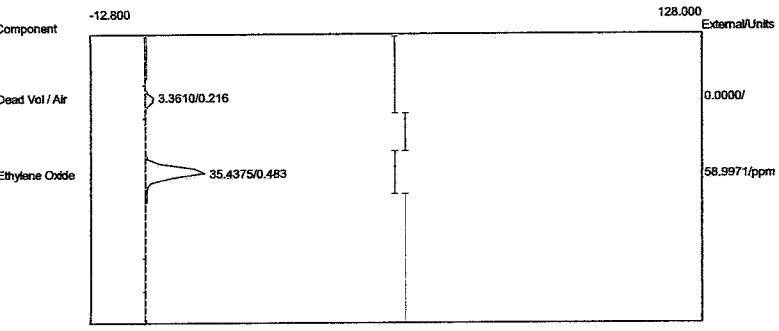
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3405	0.0000	
Ethylene Oxide	0.483	35.8790	59.7321	ppm
		39.2195	59.7321	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:46:35
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1B06.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



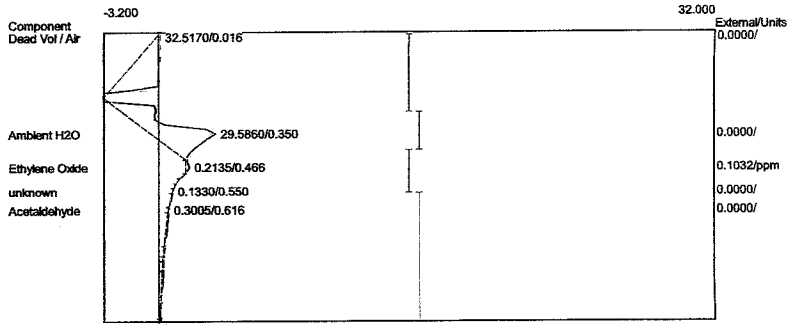
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	31.5130	0.0000	
Ambient H2O	0.350	29.8080	0.0000	
Ethylene Oxide	0.466	0.5795	0.2801	ppm
Acetaldehyde	0.900	0.1895	0.0000	
		62.0900	0.2801	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:47:46
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1B07.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



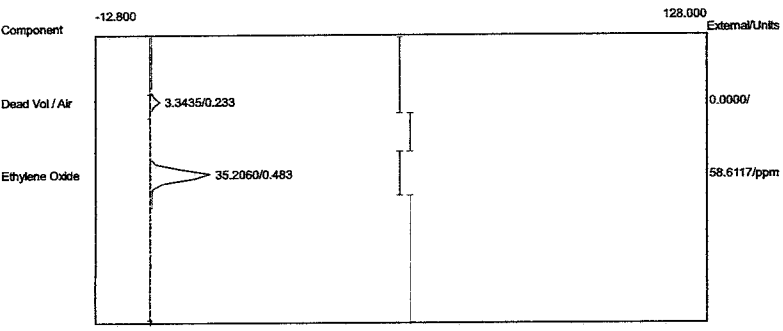
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.3610	0.0000	
Ethylene Oxide	0.483	35.4375	58.9971	ppm
		38.7985	58.9971	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:47:46
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1B07.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



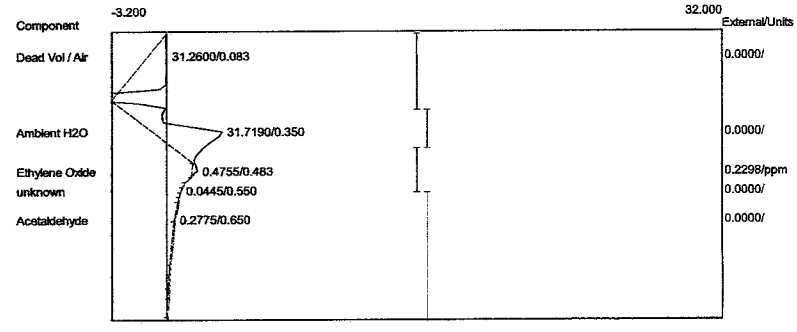
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	32.5170	0.0000	
Ambient H2O	0.350	29.5860	0.0000	
Ethylene Oxide	0.466	0.2135	0.1032	ppm
Acetaldehyde	0.616	0.3005	0.0000	
		62.6170	0.1032	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:49:00
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1B08.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



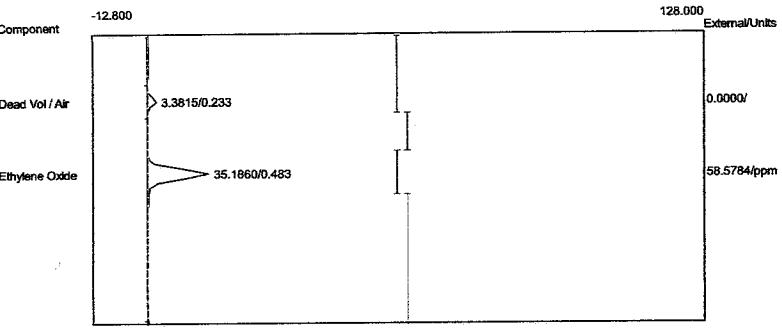
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3435	0.0000	
Ethylene Oxide	0.483	35.2060	58.6117	ppm
		38.5495	58.6117	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:49:00
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1B08.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



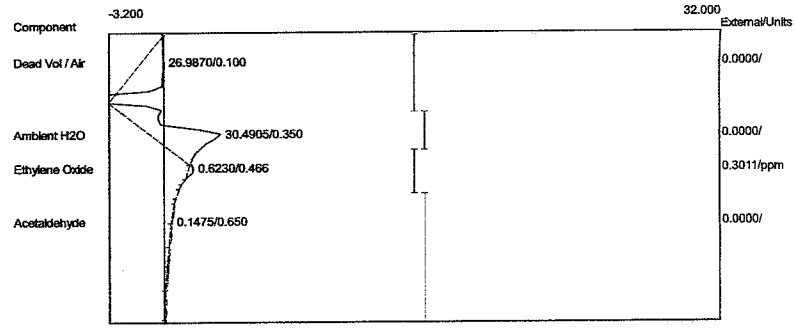
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	31.2600	0.0000	
Ambient H2O	0.350	31.7190	0.0000	
Ethylene Oxide	0.483	0.4755	0.2298	ppm
Acetaldehyde	0.650	0.2775	0.0000	
		63.7320	0.2298	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:50:14
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1B09.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



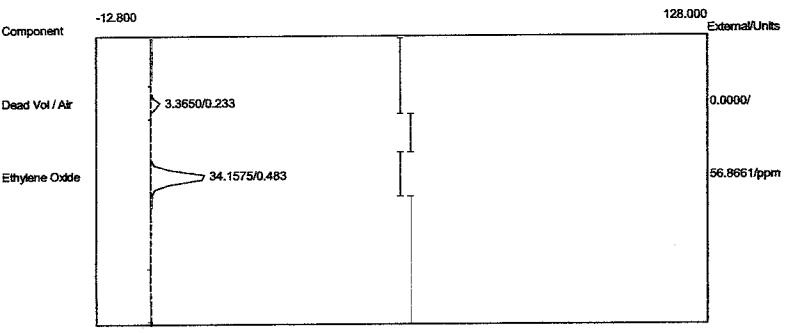
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3815	0.0000	
Ethylene Oxide	0.483	35.1860	58.5784	ppm
		38.5675	58.5784	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:50:14
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1B09.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



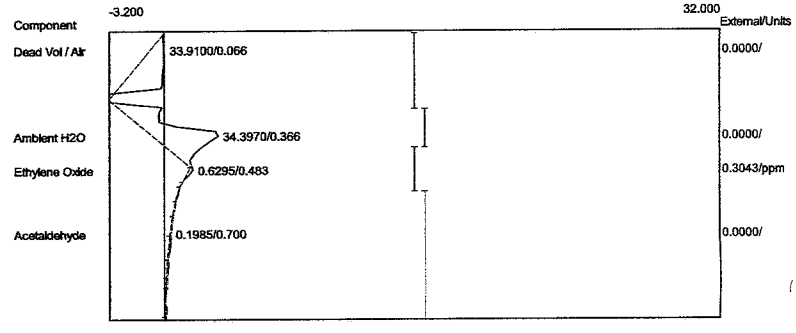
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	26.9870	0.0000	
Ambient H2O	0.350	30.4905	0.0000	
Ethylene Oxide	0.466	0.6230	0.3011	ppm
Acetaldehyde	0.650	0.1475	0.0000	
		58.2480	0.3011	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:51:27
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1B10.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



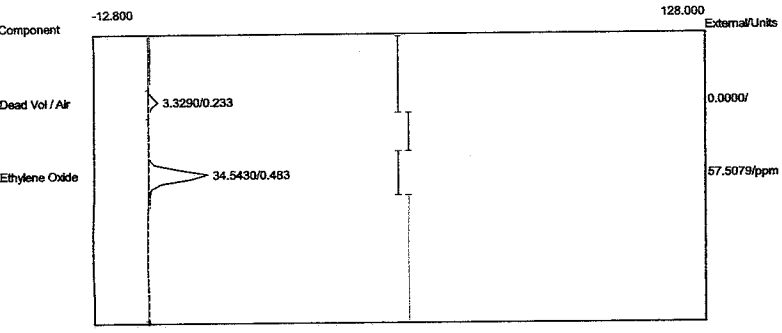
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3650	0.0000	
Ethylene Oxide	0.483	34.1575	56.8661	ppm
		37.5225	56.8661	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:51:27
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1B10.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



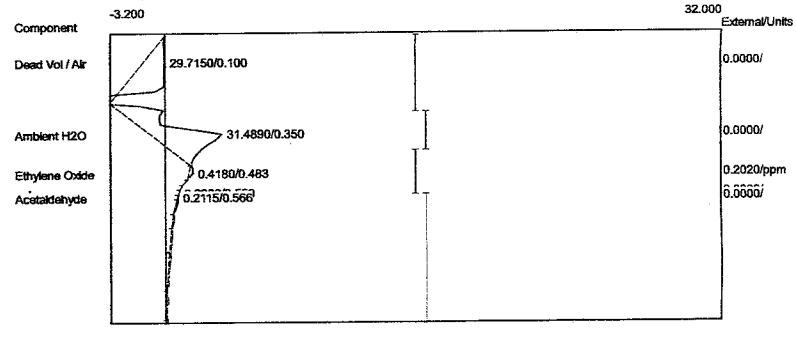
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	33.9100	0.0000	
Ambient H2O	0.366	34.3970	0.0000	
Ethylene Oxide	0.483	0.6295	0.3043	ppm
Acetaldehyde	0.700	0.1985	0.0000	
		69.1350	0.3043	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:52:40
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1B11.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



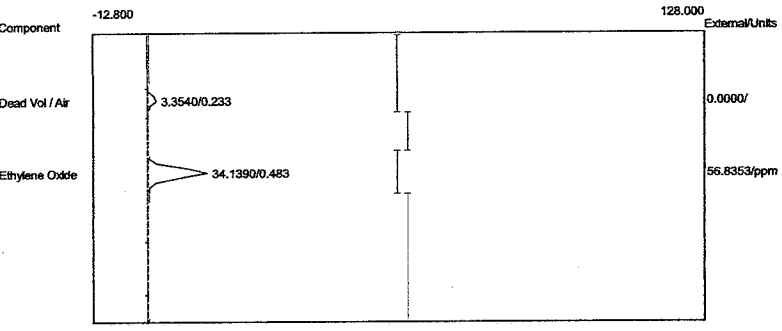
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3290	0.0000	
Ethylene Oxide	0.483	34.5430	57.5079	ppm
		37.8720	57.5079	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:52:40
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1B11.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



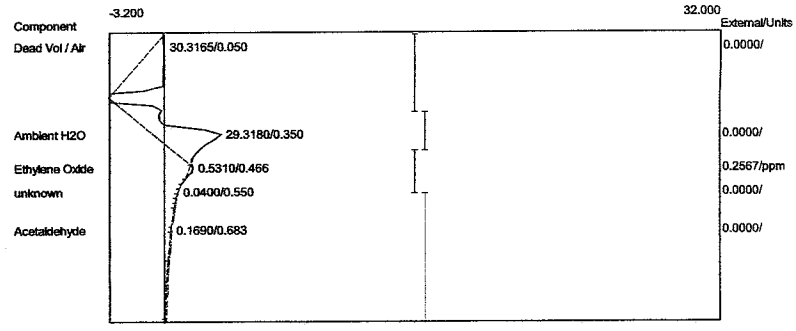
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	29.7150	0.0000	
Ambient H2O	0.350	31.4890	0.0000	
Ethylene Oxide	0.483	0.4180	0.2020	ppm
Acetaldehyde	0.566	0.2115	0.0000	
		61.8335	0.2020	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:53:51
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1B12.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3540	0.0000	
Ethylene Oxide	0.483	34.1390	56.8353	ppm
		37.4930	56.8353	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1BV
Analysis date: 12/12/2019 12:53:51
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1B12.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer

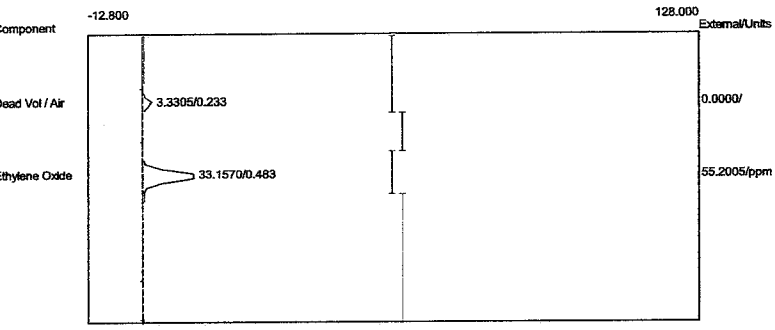


Component	Retention	Area	External	Units
Dead Vol / Air	0.050	30.3165	0.0000	
Ambient H2O	0.350	29.3180	0.0000	
Ethylene Oxide	0.466	0.5310	0.2567	ppm
Acetaldehyde	0.683	0.1690	0.0000	
		60.3345	0.2567	

APPENDIX C

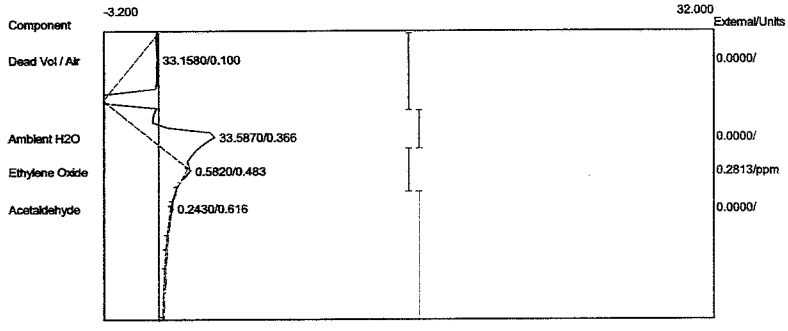
Run #1 Chromatograms – Aeration

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 12:56:51
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1A01.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



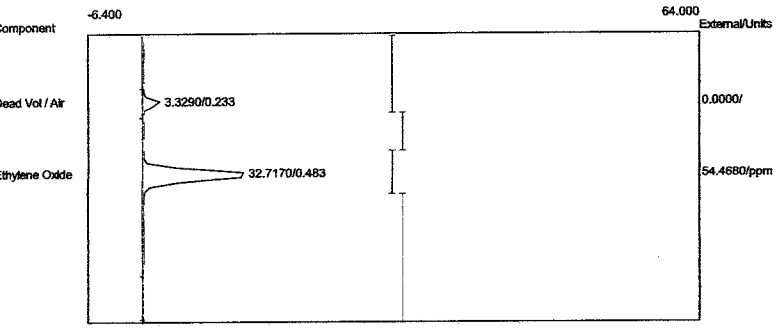
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3305	0.0000	
Ethylene Oxide	0.483	33.1570	55.2005	ppm
		36.4875	55.2005	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 12:56:51
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1A01.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



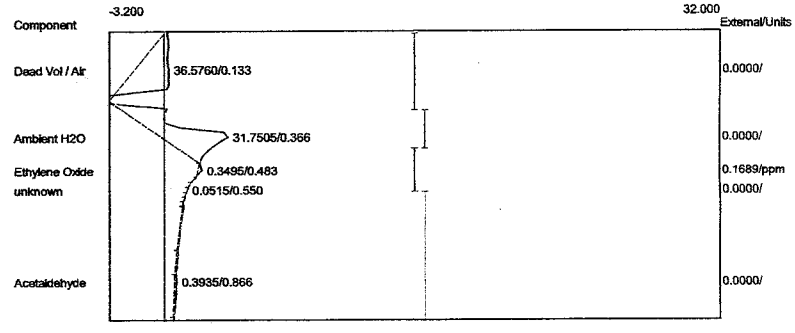
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	33.1580	0.0000	
Ambient H2O	0.366	33.5870	0.0000	
Ethylene Oxide	0.483	0.5820	0.2813	ppm
Acetaldehyde	0.616	0.2430	0.0000	
		67.5700	0.2813	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:01:02
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1A02.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



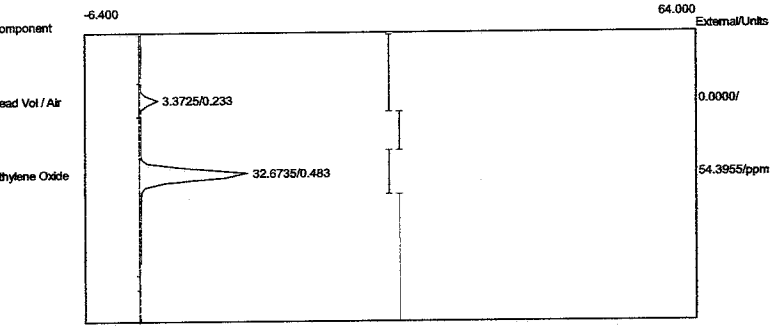
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3290	0.0000	
Ethylene Oxide	0.483	32.7170	54.4680	ppm
		36.0460	54.4680	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:01:02
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1A02.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



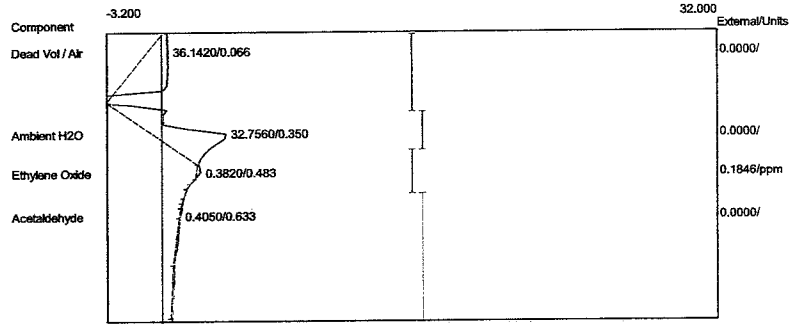
Component	Retention	Area	External	Units
Dead Vol / Air	0.133	36.5760	0.0000	
Ambient H2O	0.366	31.7505	0.0000	
Ethylene Oxide	0.483	0.3495	0.1689	ppm
Acetaldehyde	0.866	0.3935	0.0000	
		69.0695	0.1689	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:06:35
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1A03.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



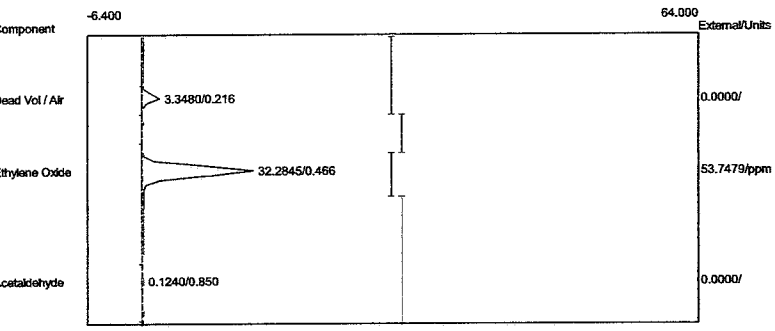
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3725	0.0000	
Ethylene Oxide	0.483	32.6735	54.3955	ppm
		36.0460	54.3955	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:06:35
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1A03.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



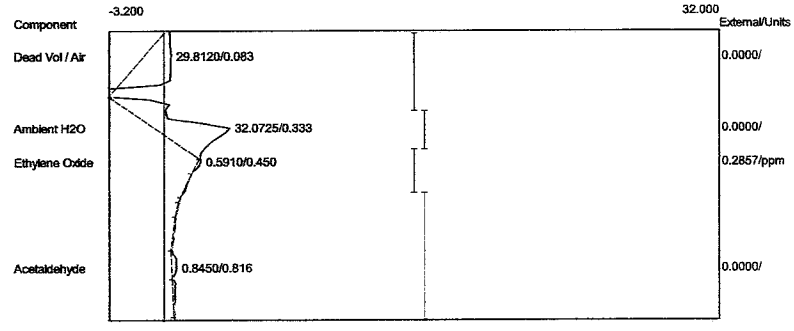
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	36.1420	0.0000	
Ambient H2O	0.350	32.7560	0.0000	
Ethylene Oxide	0.483	0.3820	0.1846	ppm
Acetaldehyde	0.633	0.4050	0.0000	
		69.6850	0.1846	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:11:22
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1A04.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



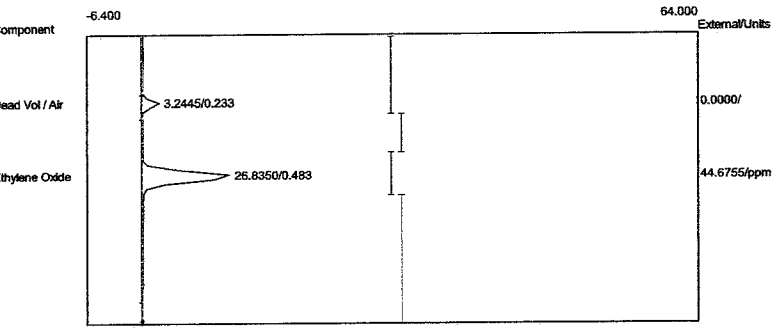
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.3480	0.0000	
Ethylene Oxide	0.466	32.2845	53.7479	ppm
Acetaldehyde	0.850	0.1240	0.0000	
		35.7565	53.7479	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:11:22
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1A04.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



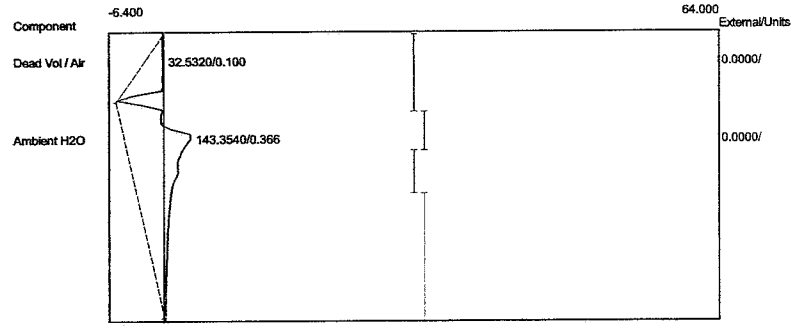
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	29.8120	0.0000	
Ambient H2O	0.333	32.0725	0.0000	
Ethylene Oxide	0.450	0.5910	0.2857	ppm
Acetaldehyde	0.816	0.8450	0.0000	
		63.3205	0.2857	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:16:44
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1A05.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



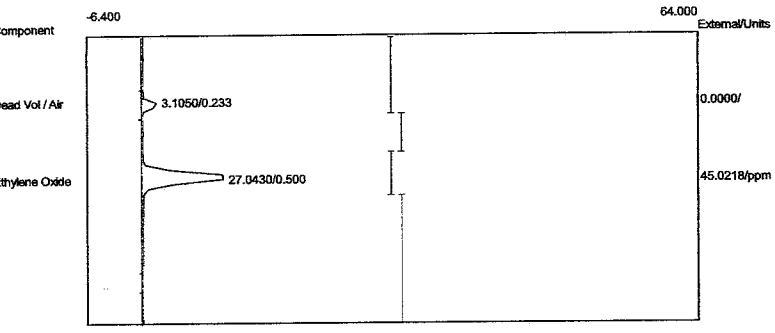
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2445	0.0000	
Ethylene Oxide	0.483	26.8350	44.6755	ppm
		30.0795	44.6755	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:16:44
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: c:\peak359\2SterQB2019-1A05.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



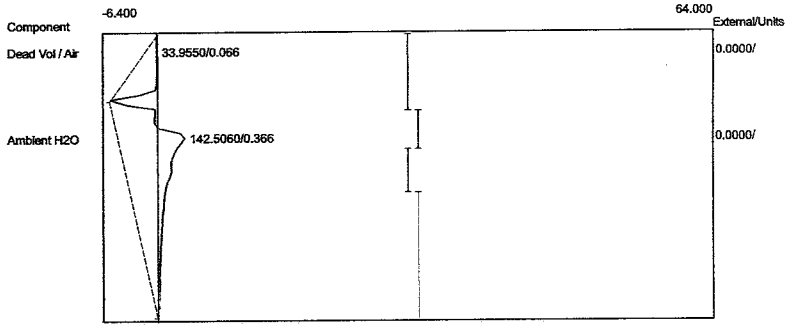
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	32.5320	0.0000	
Ambient H2O	0.366	143.3540	0.0000	
		175.8860	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:21:21
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1A06.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



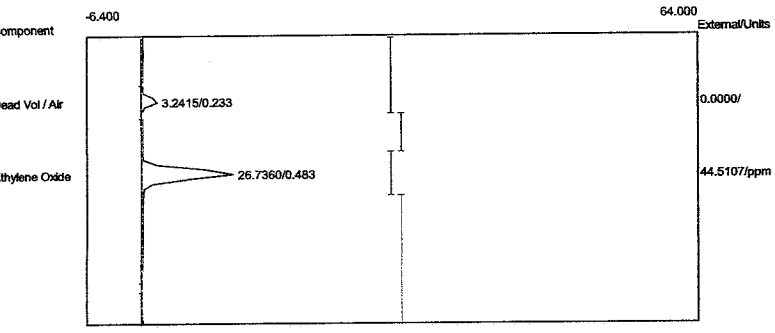
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.1050	0.0000	
Ethylene Oxide	0.500	27.0430	45.0218	ppm
		30.1480	45.0218	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:21:21
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1A06.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



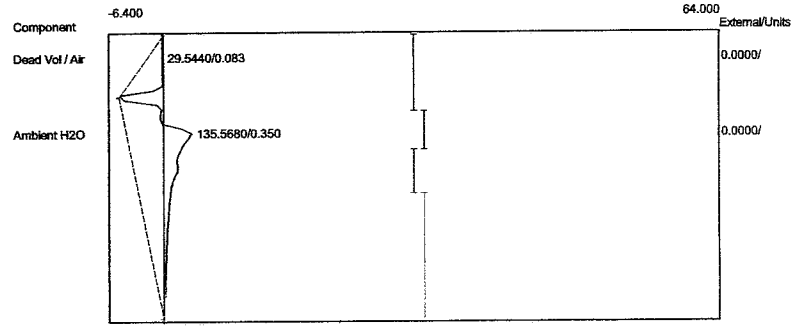
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	33.9550	0.0000	
Ambient H2O	0.366	142.5060	0.0000	
		176.4610	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:26:18
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1A07.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



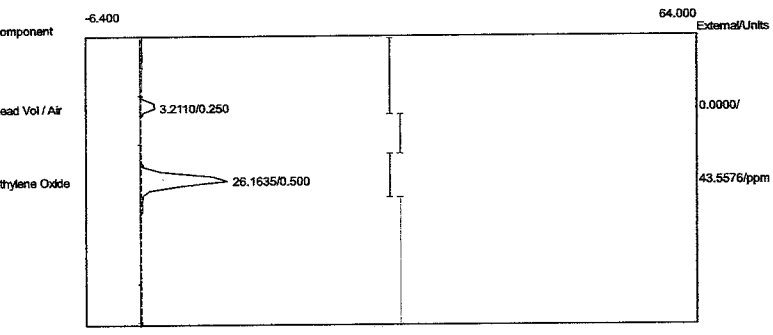
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2415	0.0000	
Ethylene Oxide	0.483	26.7360	44.5107	ppm
		29.9775	44.5107	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:26:18
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1A07.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



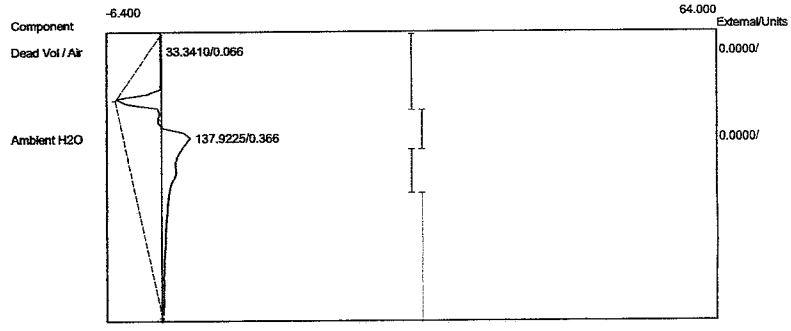
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	29.5440	0.0000	
Ambient H2O	0.350	135.5680	0.0000	
		165.1120	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:31:08
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1A08.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



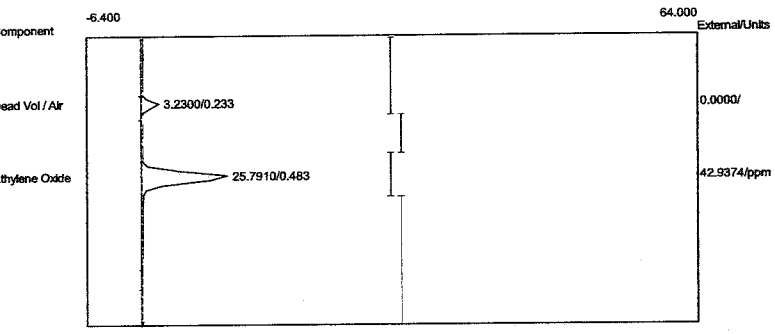
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	3.2110	0.0000	
Ethylene Oxide	0.500	26.1635	43.5576	ppm
		29.3745	43.5576	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:31:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1A08.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



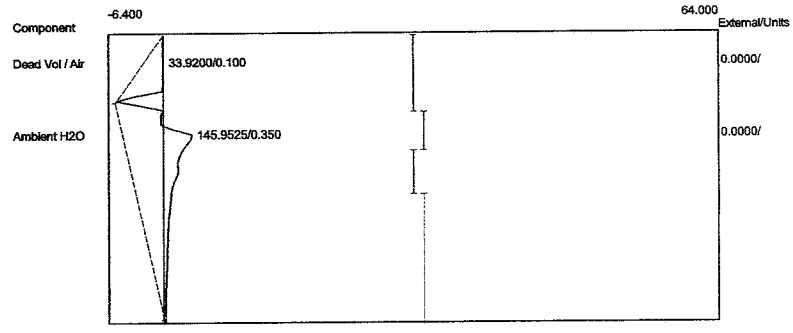
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	33.3410	0.0000	
Ambient H2O	0.366	137.9225	0.0000	
		171.2635	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:36:32
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1A09.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



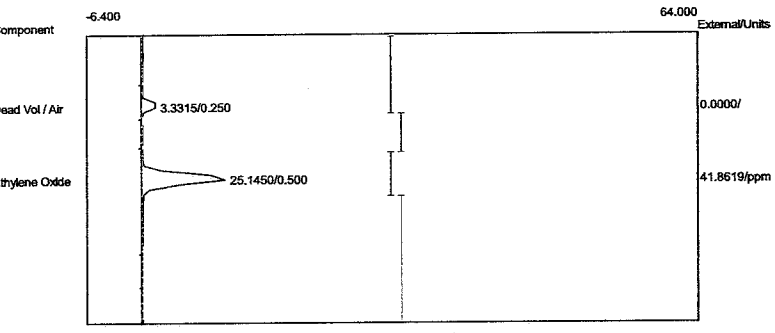
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2300	0.0000	
Ethylene Oxide	0.483	25.7910	42.9374	ppm
		29.0210	42.9374	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:36:32
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1A09.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



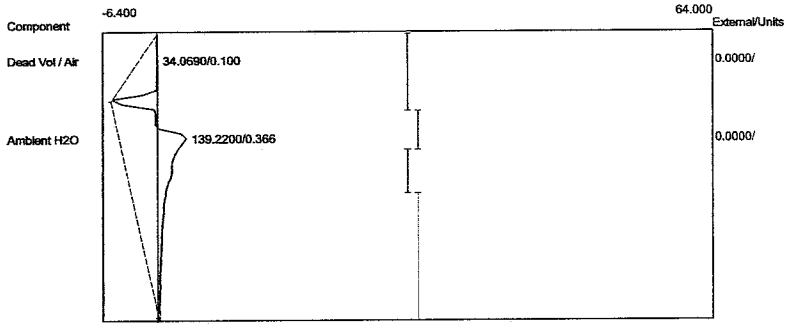
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	33.9200	0.0000	
Ambient H2O	0.350	145.9525	0.0000	
		179.8725	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:41:09
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1A10.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



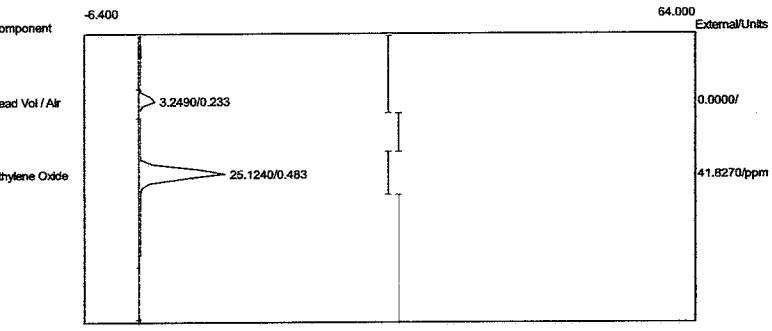
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	3.3315	0.0000	
Ethylene Oxide	0.500	25.1450	41.8619	ppm
		28.4765	41.8619	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:41:09
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1A10.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



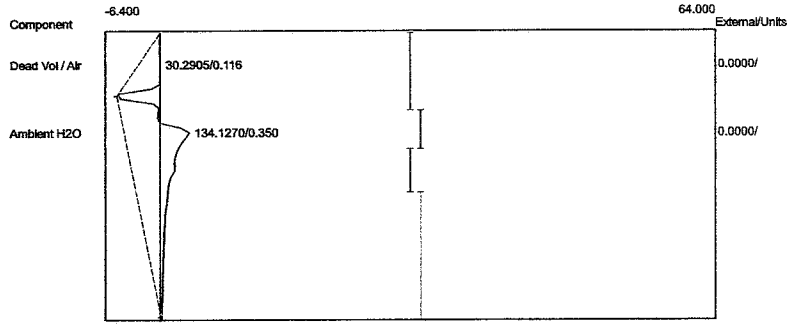
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	34.0690	0.0000	
Ambient H2O	0.366	139.2200	0.0000	
		173.2890	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:46:37
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1A11.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



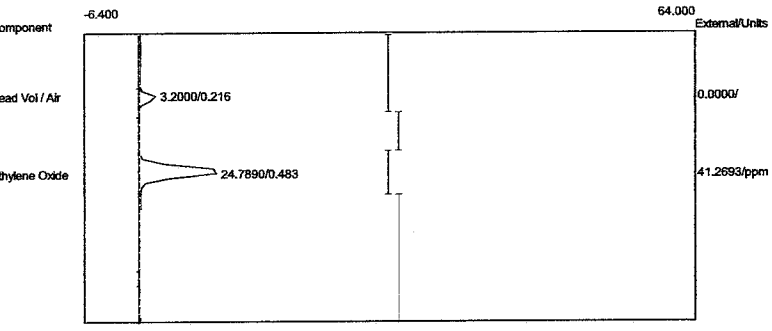
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2490	0.0000	
Ethylene Oxide	0.483	25.1240	41.8270	ppm
		28.3730	41.8270	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:46:37
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1A11.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



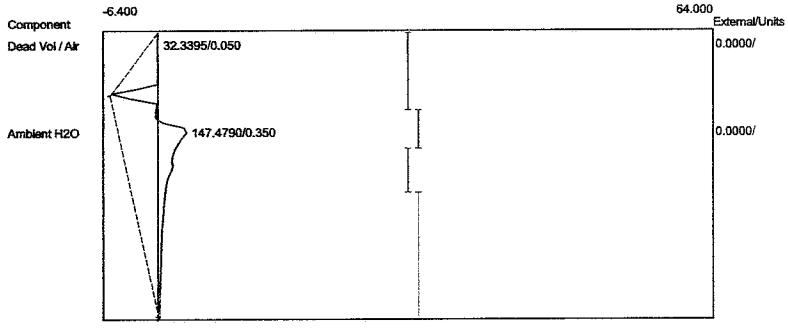
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	30.2905	0.0000	
Ambient H2O	0.350	134.1270	0.0000	
		164.4175	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:51:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-1A12.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.2000	0.0000	
Ethylene Oxide	0.483	24.7890	41.2693	ppm
		27.9890	41.2693	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#1Aer
Analysis date: 12/12/2019 13:51:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-1A12.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer

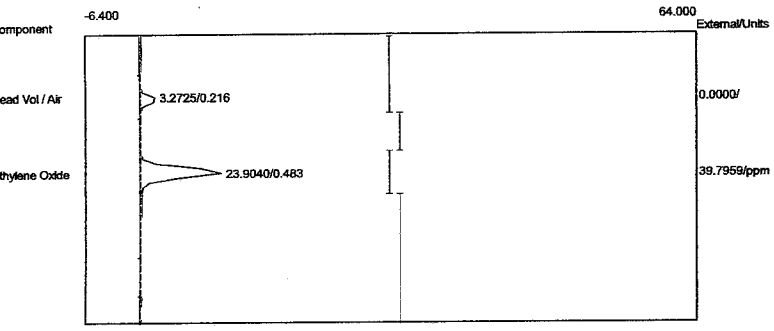


Component	Retention	Area	External	Units
Dead Vol / Air	0.050	32.3395	0.0000	
Ambient H2O	0.350	147.4790	0.0000	
		179.8185	0.0000	

APPENDIX D

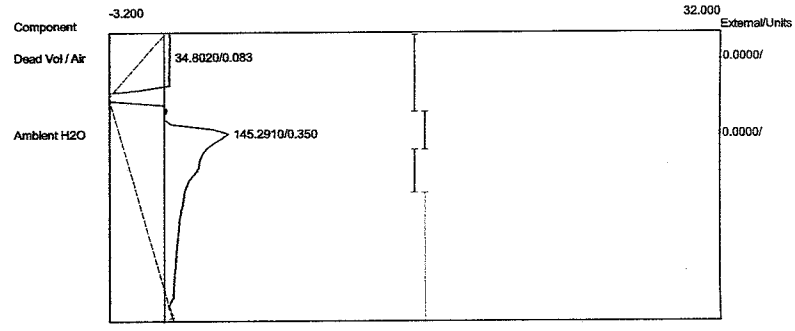
Run #2 Chromatograms – Backvent

Lab name: EOSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 13:57:01
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2B01.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



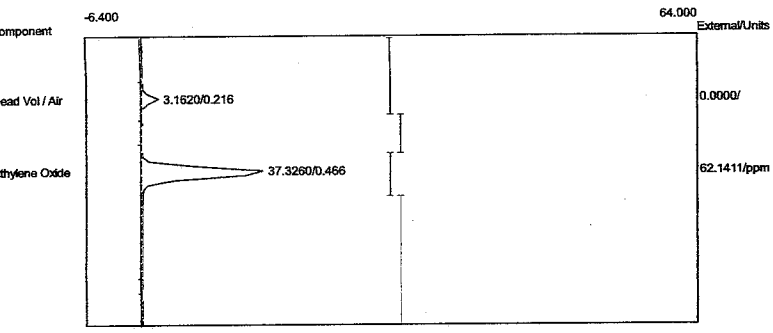
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.2725	0.0000	
Ethylene Oxide	0.483	23.9040	39.7959	ppm
		27.1765	39.7959	

Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 13:57:01
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2B01.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



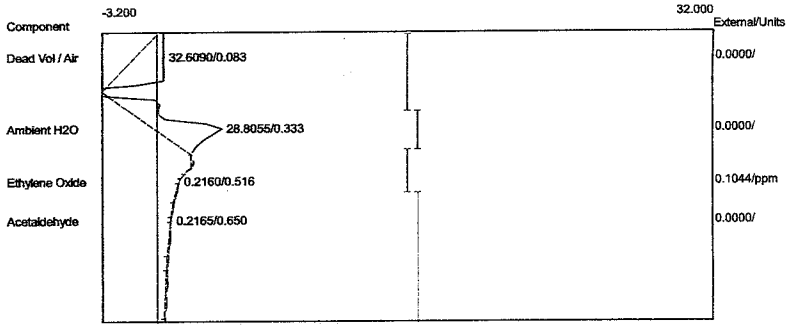
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	34.8020	0.0000	
Ambient H2O	0.350	145.2910	0.0000	
		180.0930	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 13:58:16
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2B02.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



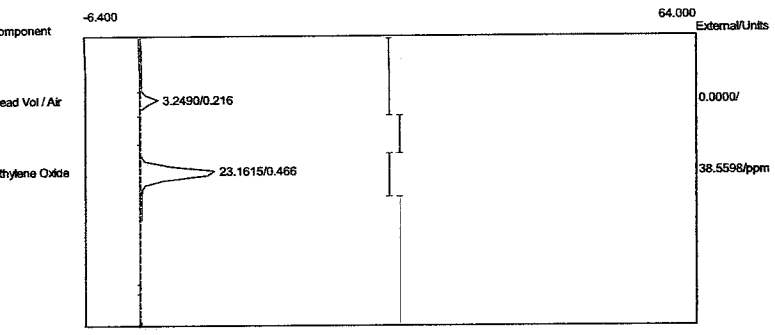
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.1620	0.0000	
Ethylene Oxide	0.466	37.3260	62.1411	ppm
		40.4880	62.1411	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 13:58:16
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2B02.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



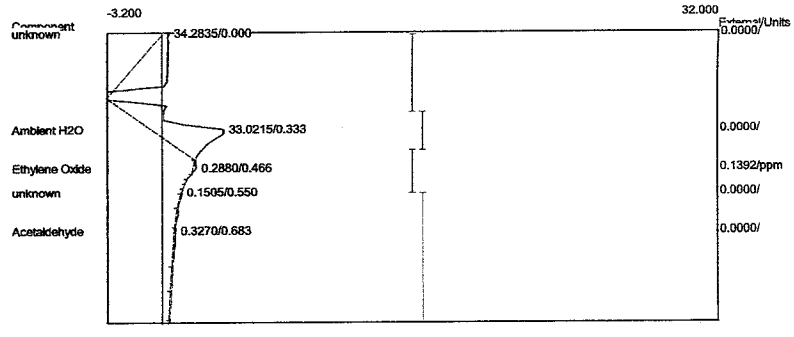
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	32.6090	0.0000	
Ambient H2O	0.333	28.8055	0.0000	
Ethylene Oxide	0.516	0.2160	0.1044	ppm
Acetaldehyde	0.650	0.2165	0.0000	
		61.8470	0.1044	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 13:59:30
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2B03.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



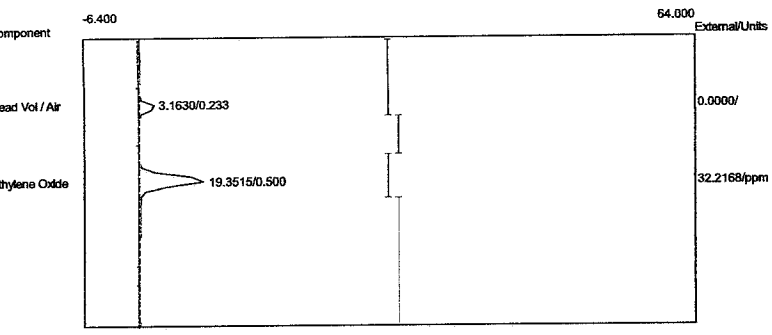
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.2490	0.0000	
Ethylene Oxide	0.466	23.1615	38.5598	ppm
		26.4105	38.5598	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 13:59:30
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2B03.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



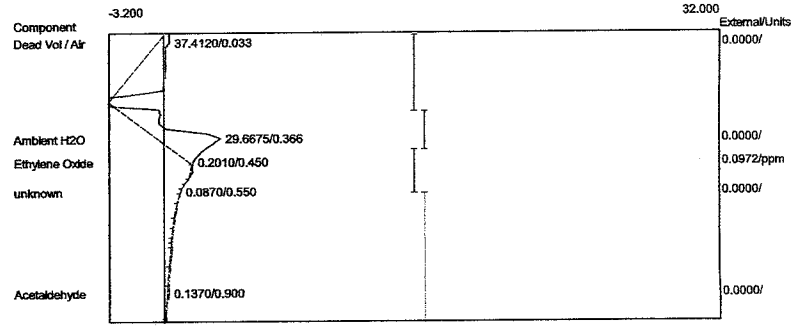
Component	Retention	Area	External	Units
Ambient H2O	0.333	33.0215	0.0000	
Ethylene Oxide	0.466	0.2880	0.1392	ppm
Acetaldehyde	0.683	0.3270	0.0000	
		33.6365	0.1392	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 14:01:00
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2B04.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



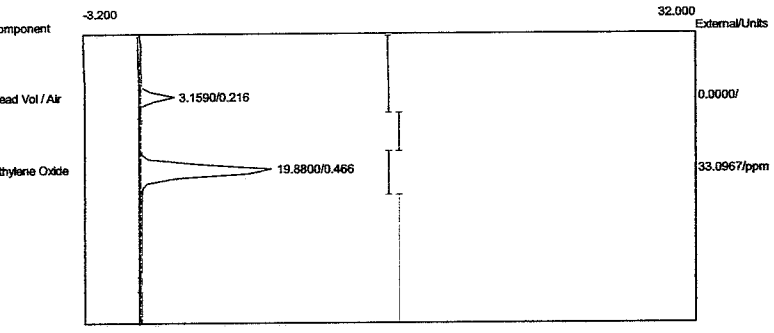
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.1630	0.0000	
Ethylene Oxide	0.500	19.3515	32.2168	ppm
		22.5145	32.2168	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 14:01:00
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2B04.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



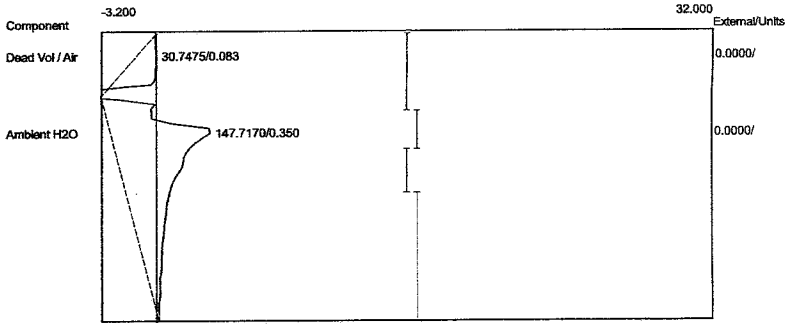
Component	Retention	Area	External	Units
Dead Vol / Air	0.033	37.4120	0.0000	
Ambient H2O	0.366	29.6675	0.0000	
Ethylene Oxide	0.450	0.2010	0.0972	ppm
Acetaldehyde	0.900	0.1370	0.0000	
		67.4175	0.0972	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 14:02:35
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2B05.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



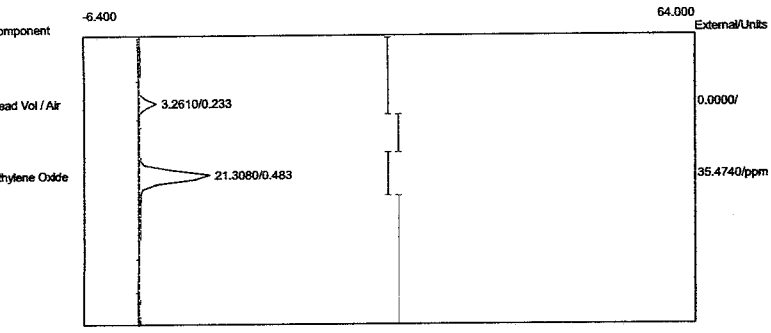
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.1590	0.0000	
Ethylene Oxide	0.466	19.8800	33.0967	ppm
		23.0390	33.0967	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 14:02:35
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2B05.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



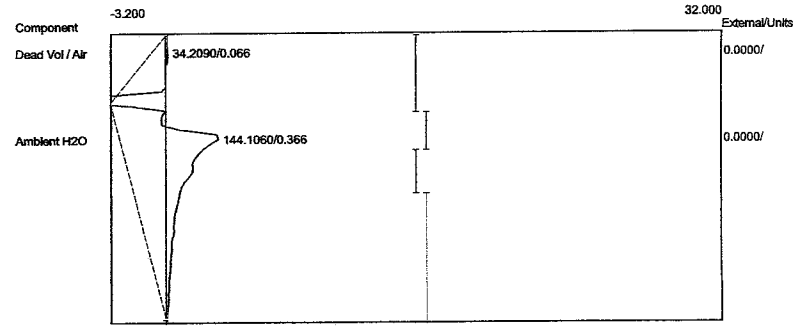
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	30.7475	0.0000	
Ambient H2O	0.350	147.7170	0.0000	
		178.4645	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 14:03:39
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2B06.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



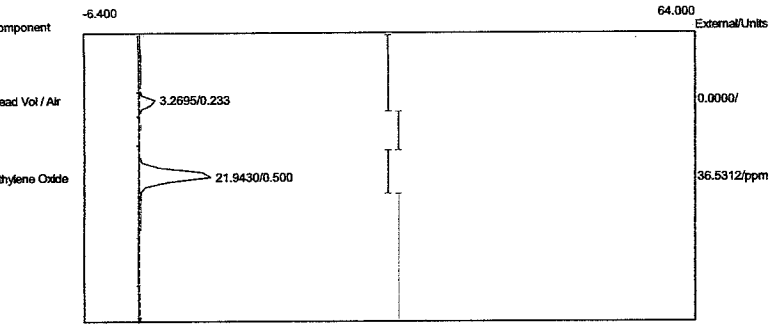
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2610	0.0000	
Ethylene Oxide	0.483	21.3080	35.4740	ppm
		24.5690	35.4740	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 14:03:39
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2B06.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



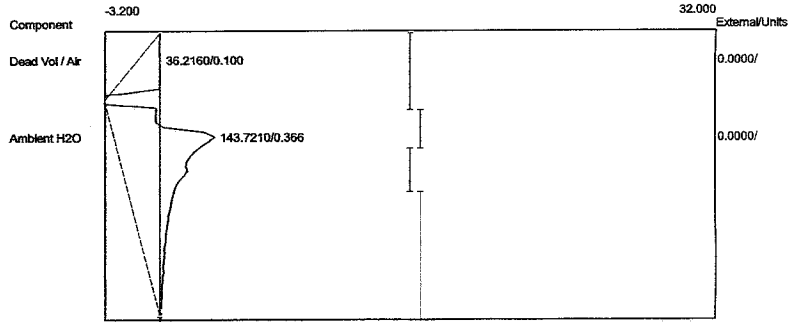
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	34.2090	0.0000	
Ambient H2O	0.366	144.1060	0.0000	
		178.3150	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 14:04:45
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2B07.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



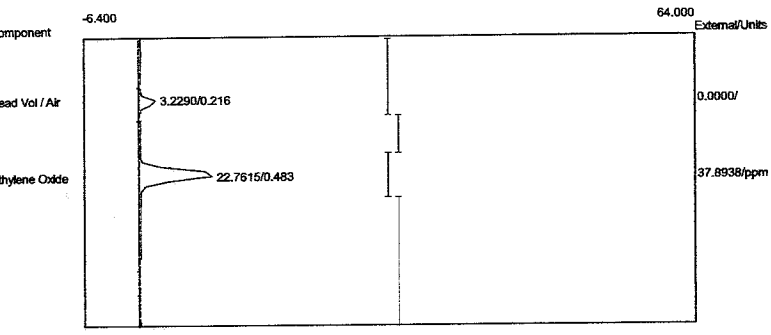
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2695	0.0000	
Ethylene Oxide	0.500	21.9430	36.5312	ppm
		25.2125	36.5312	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 14:04:45
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2B07.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



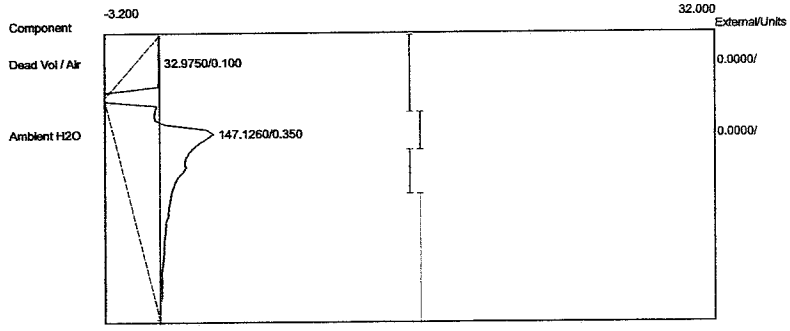
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	36.2160	0.0000	
Ambient H2O	0.366	143.7210	0.0000	
		179.9370	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 14:05:51
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2B08.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



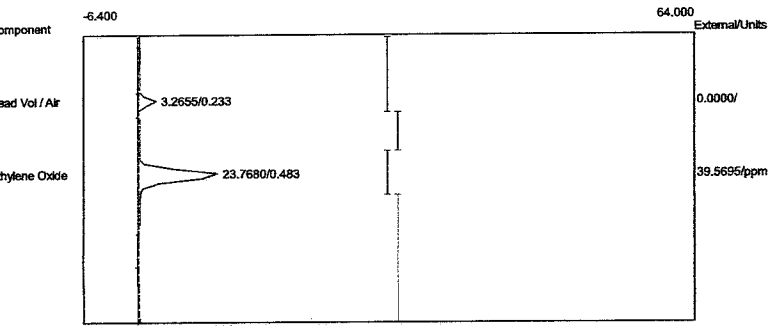
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.2290	0.0000	
Ethylene Oxide	0.483	22.7615	37.8938	ppm
		25.9905	37.8938	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 14:05:51
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2B08.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



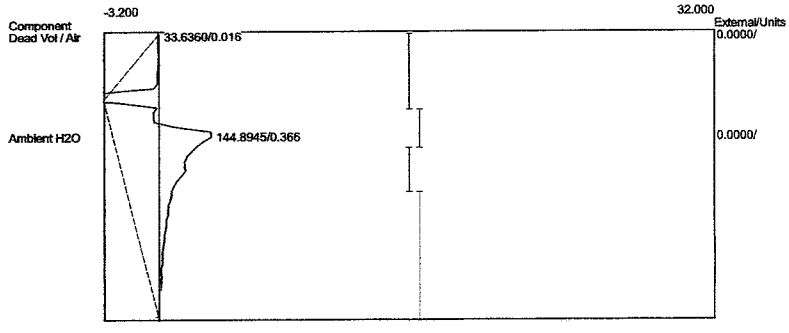
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	32.9750	0.0000	
Ambient H2O	0.350	147.1260	0.0000	
		180.1010	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 14:06:59
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2B09.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



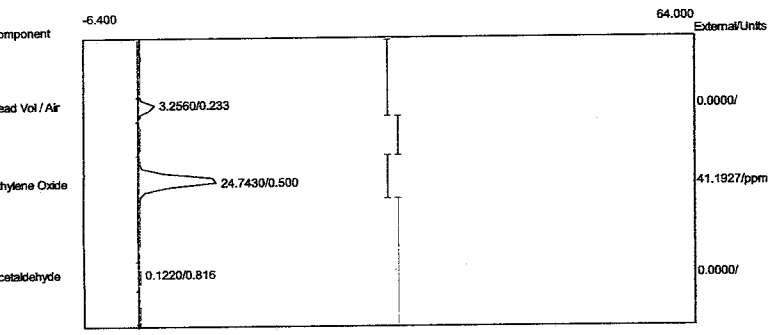
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2655	0.0000	
Ethylene Oxide	0.483	23.7680	39.5695	ppm
		27.0335	39.5695	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 14:06:59
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2B09.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



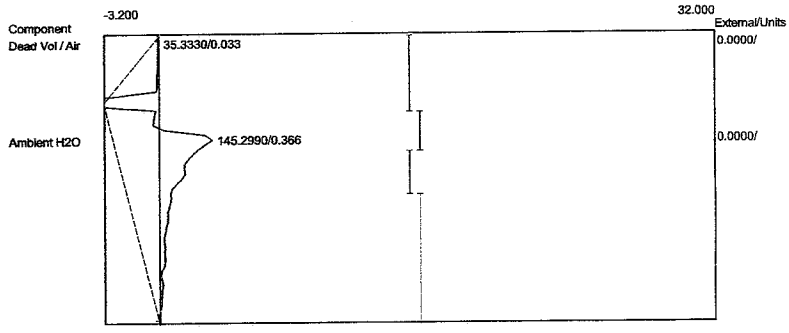
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	33.6360	0.0000	
Ambient H2O	0.366	144.8945	0.0000	
		178.5305	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 14:08:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2B10.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



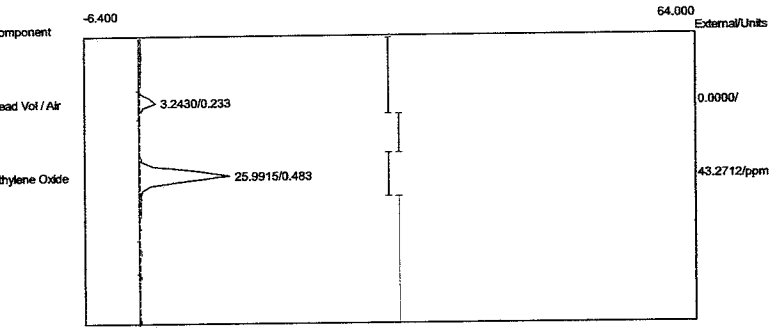
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2560	0.0000	
Ethylene Oxide	0.500	24.7430	41.1927	ppm
Acetaldehyde	0.816	0.1220	0.0000	
		28.1210	41.1927	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 14:08:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2B10.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



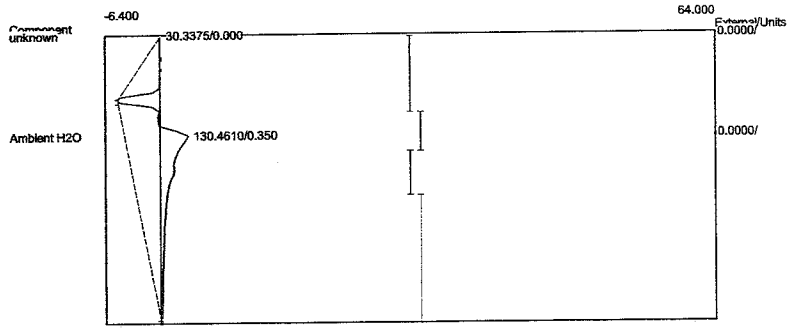
Component	Retention	Area	External	Units
Dead Vol / Air	0.033	35.3330	0.0000	
Ambient H2O	0.366	145.2990	0.0000	
		180.6320	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 14:10:22
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2B12.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2430	0.0000	
Ethylene Oxide	0.483	25.9915	43.2712	ppm
		29.2345	43.2712	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2BV
Analysis date: 12/12/2019 14:10:22
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2B12.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer

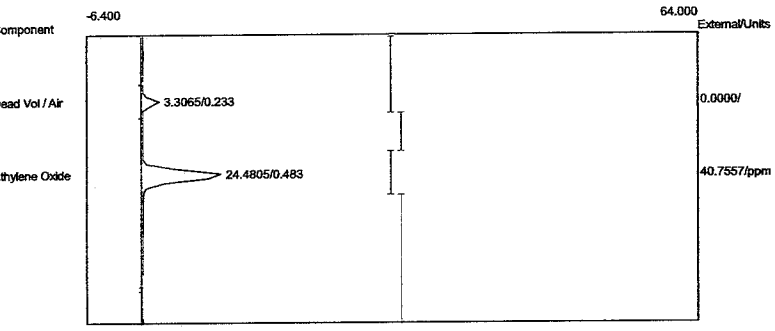


Component	Retention	Area	External	Units
Ambient H2O	0.350	130.4610	0.0000	
		130.4610	0.0000	

APPENDIX E

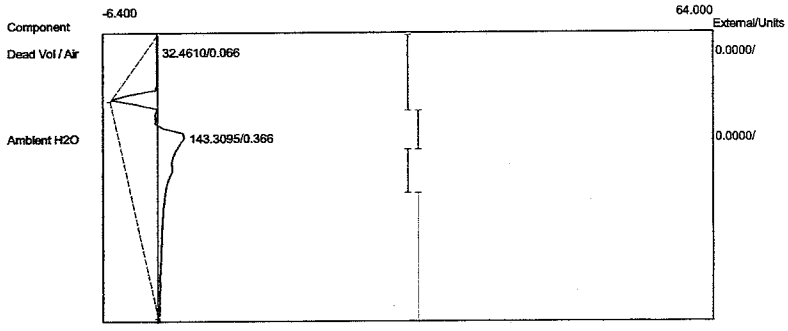
Run #2 Chromatograms – Aeration

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:13:30
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2A01.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



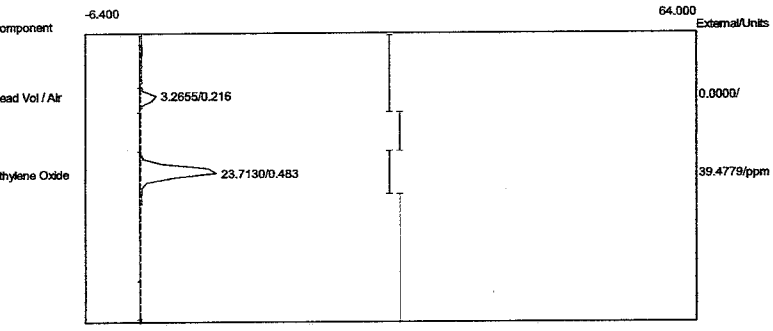
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3065	0.0000	
Ethylene Oxide	0.483	24.4805	40.7557	ppm
		27.7870	40.7557	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:13:30
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2A01.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



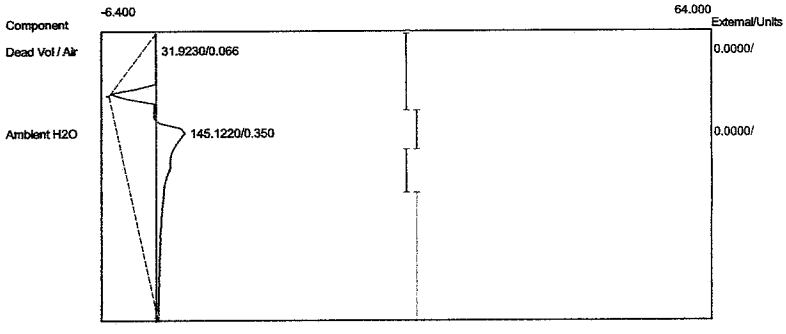
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	32.4610	0.0000	
Ambient H2O	0.366	143.3095	0.0000	
		175.7705	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:18:11
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2A02.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



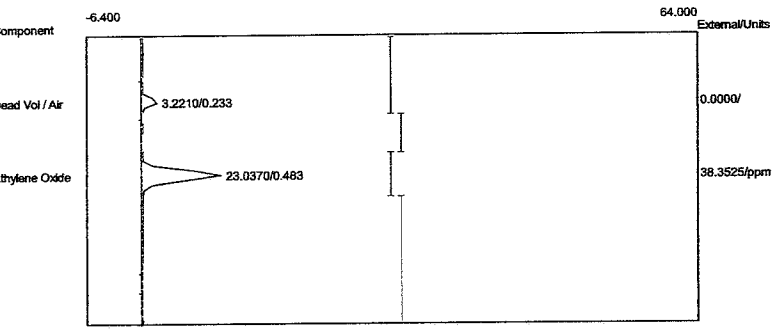
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.2655	0.0000	
Ethylene Oxide	0.483	23.7130	39.4779	ppm
		26.9785	39.4779	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:18:11
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2A02.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



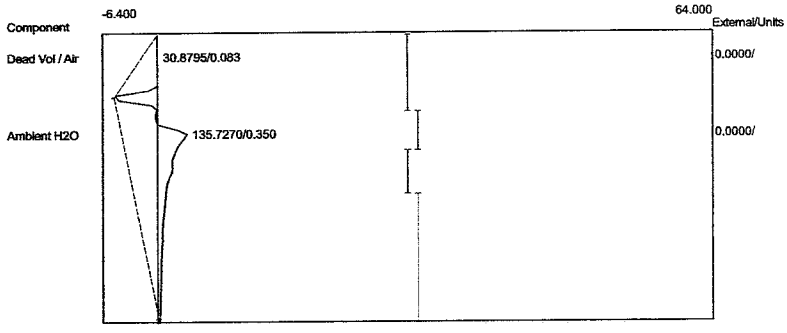
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	31.9230	0.0000	
Ambient H2O	0.350	145.1220	0.0000	
		177.0450	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:23:42
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2A03.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



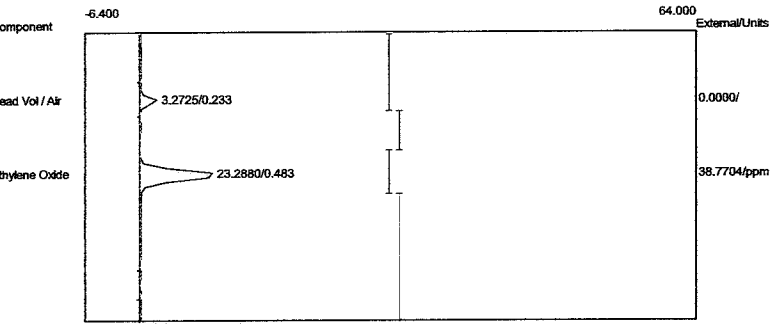
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2210	0.0000	
Ethylene Oxide	0.483	23.0370	38.3525	ppm
		26.2580	38.3525	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:23:42
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2A03.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



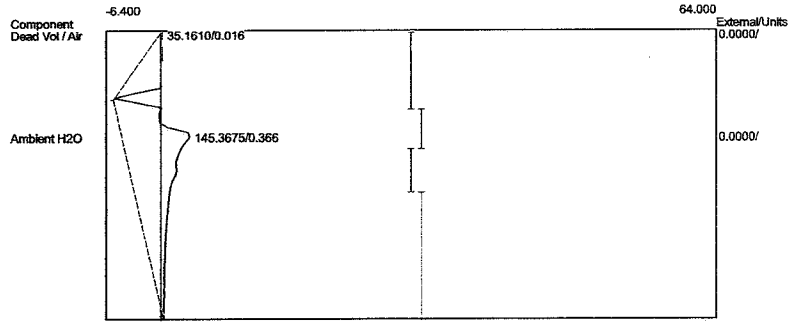
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	30.8795	0.0000	
Ambient H2O	0.350	135.7270	0.0000	
		166.6065	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:28:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2A04.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



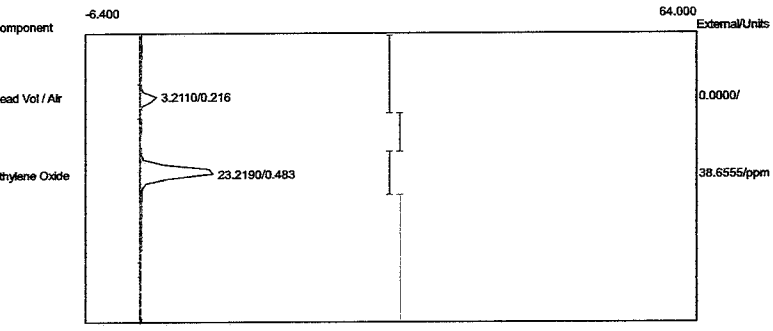
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2725	0.0000	
Ethylene Oxide	0.483	23.2880	38.7704	ppm
		26.5605	38.7704	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:28:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2A04.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



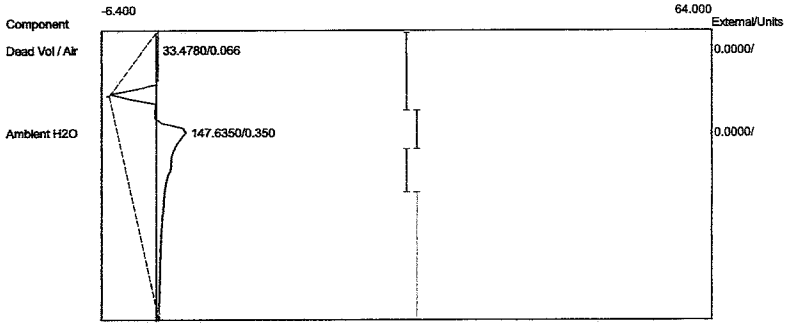
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	35.1610	0.0000	
Ambient H2O	0.366	145.3675	0.0000	
		180.5285	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:33:23
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2A05.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



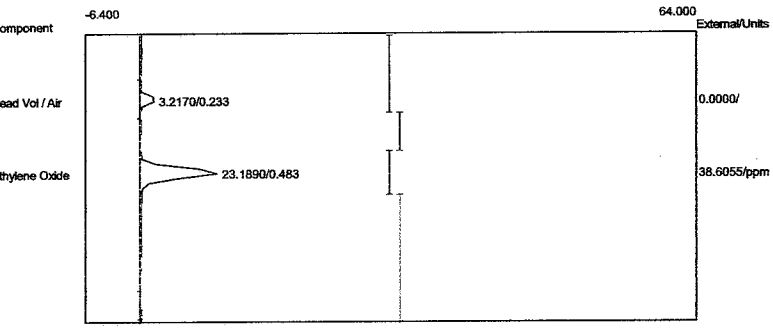
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.2110	0.0000	
Ethylene Oxide	0.483	23.2190	38.6555	ppm
		26.4300	38.6555	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:33:23
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2A05.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



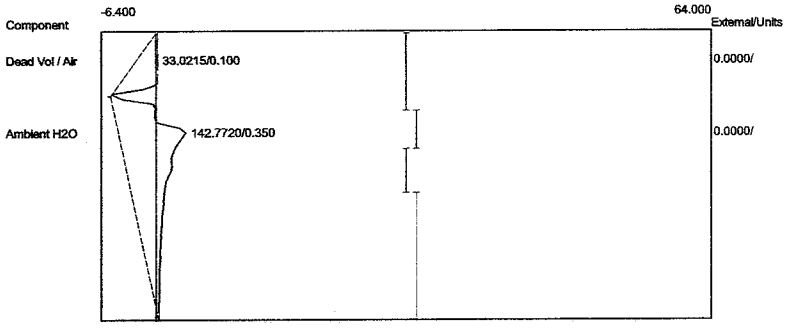
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	33.4780	0.0000	
Ambient H2O	0.350	147.6350	0.0000	
		181.1130	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:38:43
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2A06.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



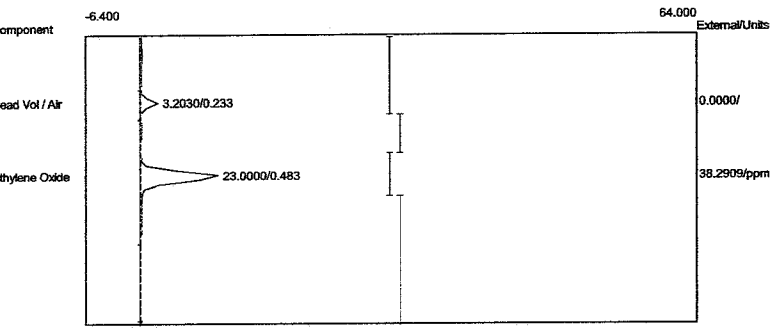
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2170	0.0000	
Ethylene Oxide	0.483	23.1890	38.6055	ppm
		26.4060	38.6055	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:38:43
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2A06.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



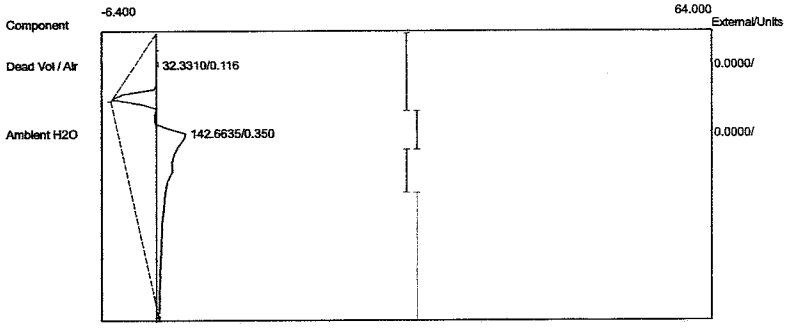
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	33.0215	0.0000	
Ambient H2O	0.350	142.7720	0.0000	
		175.7935	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:43:08
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2A07.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



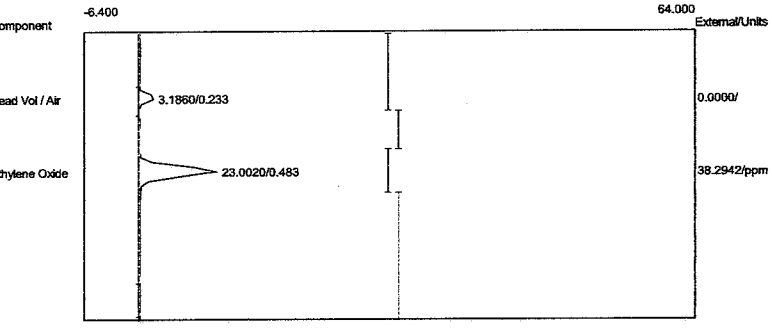
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2030	0.0000	
Ethylene Oxide	0.483	23.0000	38.2909	ppm
		26.2030	38.2909	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:43:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2A07.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



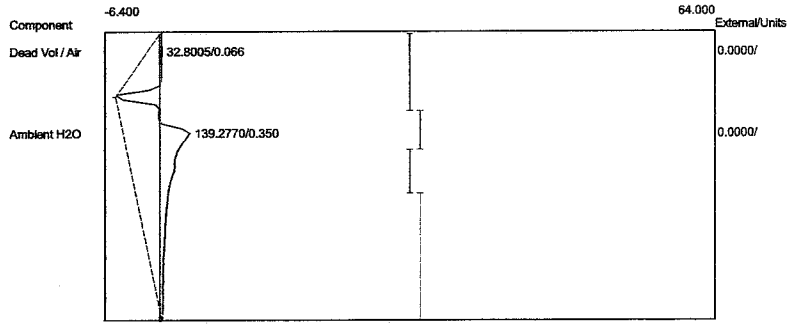
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	32.3310	0.0000	
Ambient H2O	0.350	142.6635	0.0000	
		174.9945	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:48:19
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2A08.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



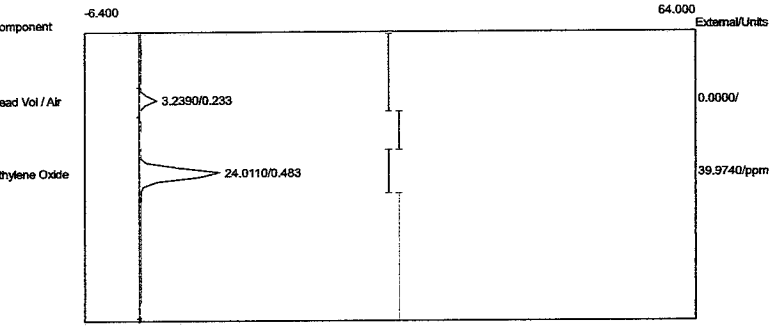
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.1860	0.0000	
Ethylene Oxide	0.483	23.0020	38.2942	ppm
		26.1880	38.2942	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:48:19
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2A08.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



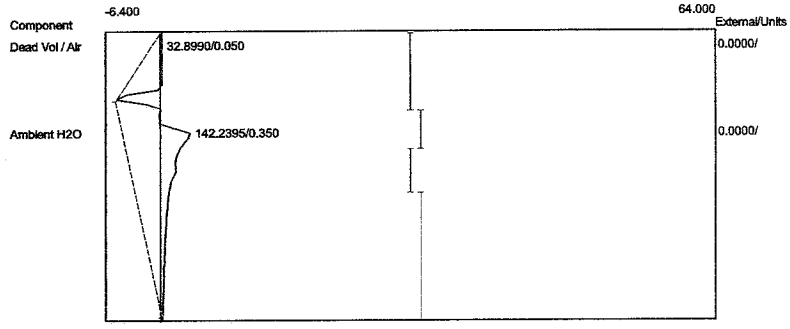
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	32.8005	0.0000	
Ambient H2O	0.350	139.2770	0.0000	
		172.0775	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:53:30
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2A09.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



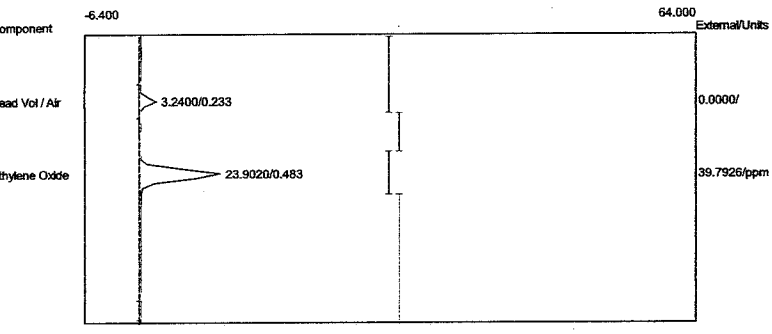
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2390	0.0000	
Ethylene Oxide	0.483	24.0110	39.9740	ppm
		27.2500	39.9740	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:53:30
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2A09.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



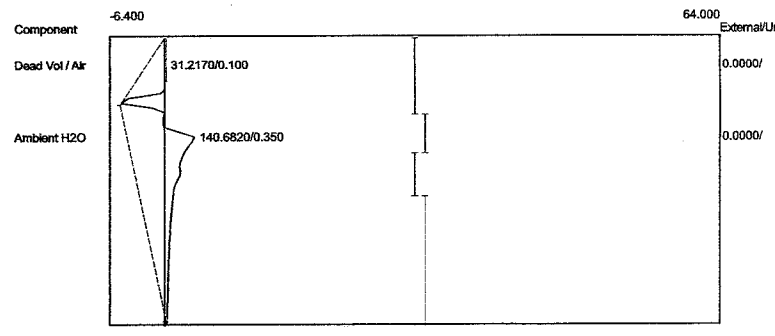
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	32.8990	0.0000	
Ambient H2O	0.350	142.2395	0.0000	
		175.1385	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:58:47
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2A10.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



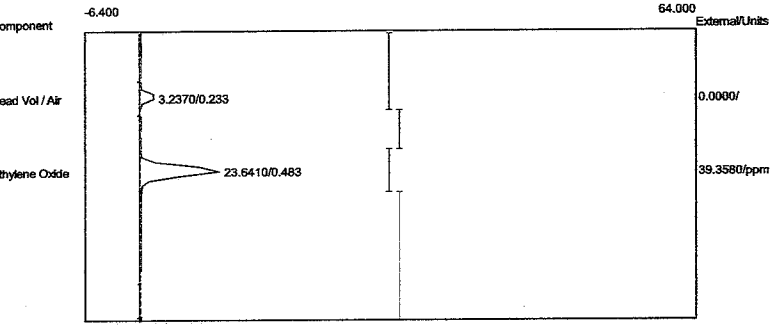
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2400	0.0000	
Ethylene Oxide	0.483	23.9020	39.7926	ppm
		27.1420	39.7926	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 14:58:47
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2A10.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



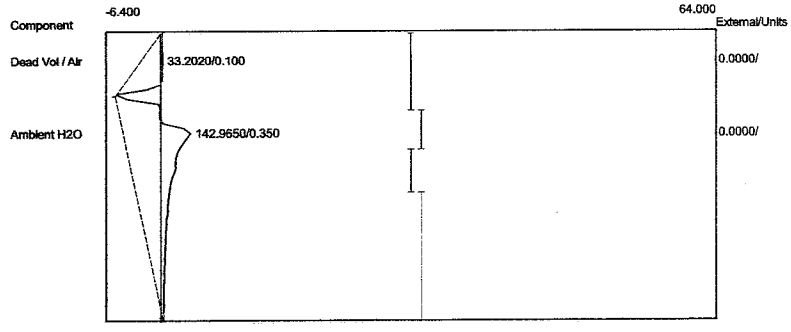
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	31.2170	0.0000	
Ambient H2O	0.350	140.6820	0.0000	
		171.8990	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 15:03:04
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2A11.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



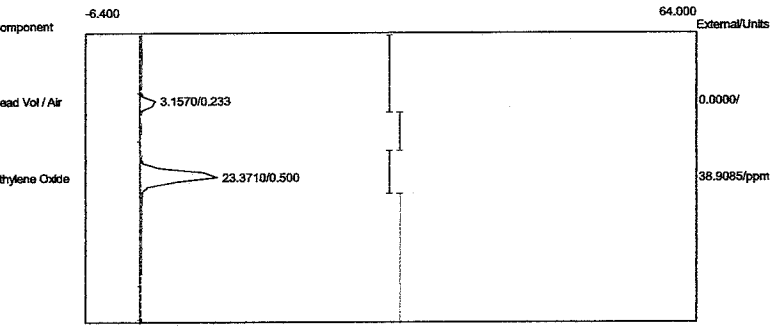
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2370	0.0000	
Ethylene Oxide	0.483	23.6410	39.3580	ppm
		26.8780	39.3580	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 15:03:04
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2A11.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



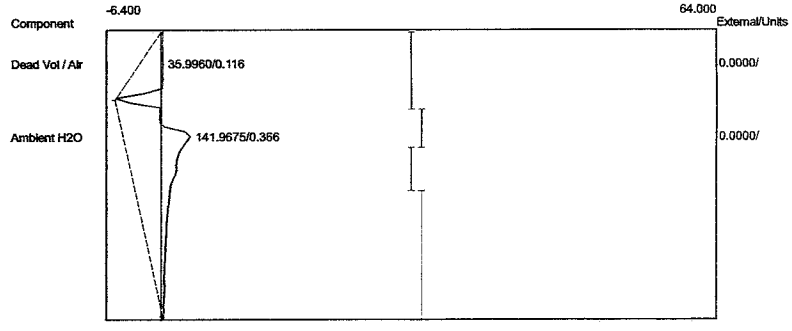
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	33.2020	0.0000	
Ambient H2O	0.350	142.9650	0.0000	
		176.1670	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 15:08:15
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-2A12.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.1570	0.0000	
Ethylene Oxide	0.500	23.3710	38.9085	ppm
		26.5280	38.9085	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#2Aer
Analysis date: 12/12/2019 15:08:15
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-2A12.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer

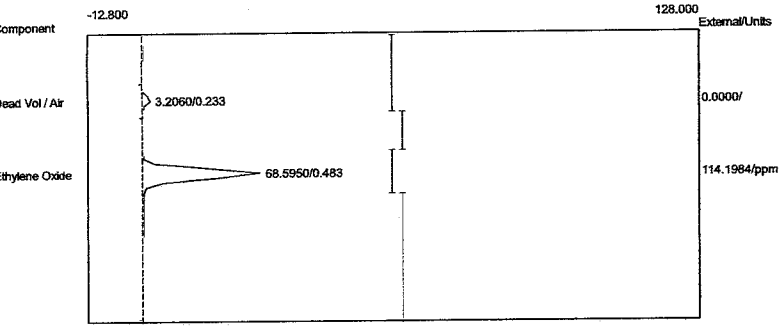


Component	Retention	Area	External	Units
Dead Vol / Air	0.116	35.9960	0.0000	
Ambient H2O	0.366	141.9675	0.0000	
		177.9635	0.0000	

APPENDIX F

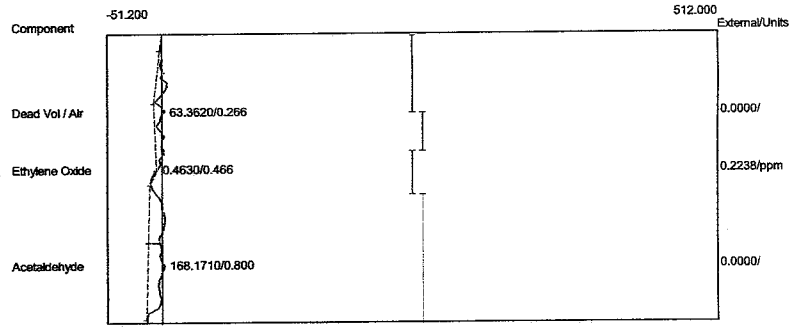
Run #3 Chromatograms – Backvent

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:17:20
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-3B01.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



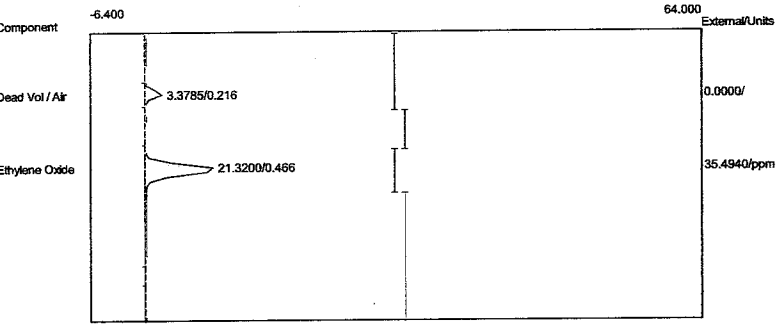
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2060	0.0000	
Ethylene Oxide	0.483	68.5950	114.1984	ppm
		71.8010	114.1984	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:17:20
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-3B01.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



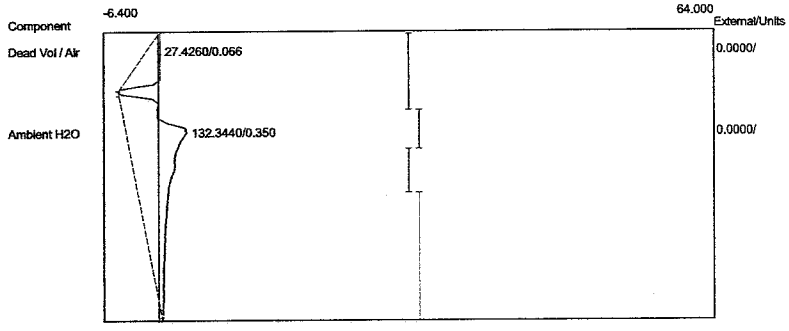
Component	Retention	Area	External	Units
Dead Vol / Air	0.266	63.3620	0.0000	
Ethylene Oxide	0.466	0.4630	0.2238	ppm
Acetaldehyde	0.800	168.1710	0.0000	
		231.9960	0.2238	

Lab name: EOSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:18:17
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-3B02.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



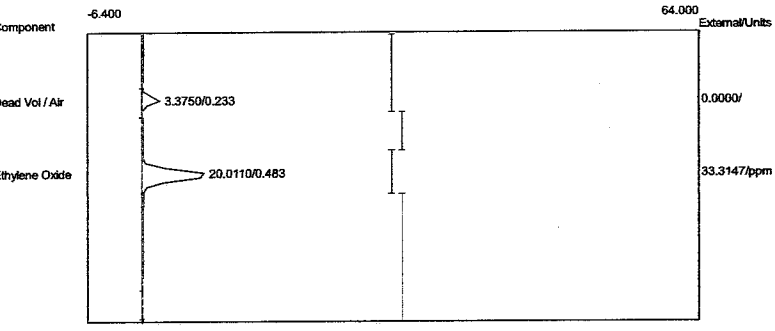
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.3785	0.0000	
Ethylene Oxide	0.466	21.3200	35.4940	ppm
		24.6985	35.4940	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:18:17
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-3B02.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



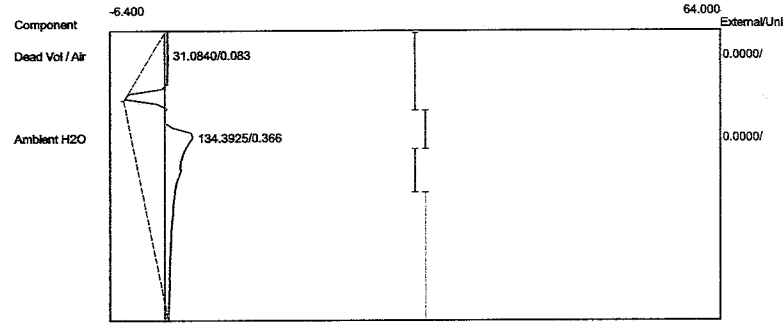
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	27.4260	0.0000	
Ambient H2O	0.350	132.3440	0.0000	
		159.7700	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:19:35
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-3B03.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



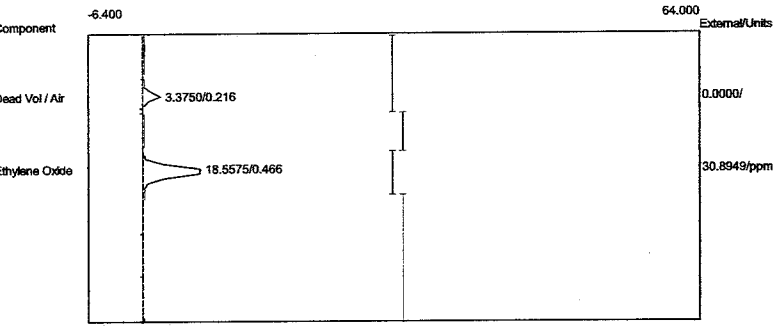
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3750	0.0000	
Ethylene Oxide	0.483	20.0110	33.3147	ppm
		23.3860	33.3147	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:19:35
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-3B03.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



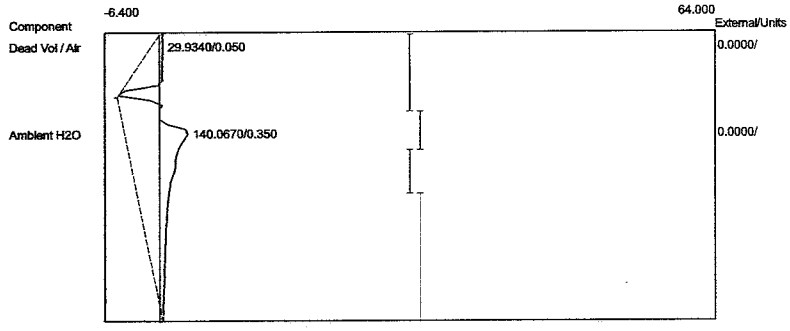
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	31.0840	0.0000	
Ambient H2O	0.366	134.3925	0.0000	
		165.4765	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:20:42
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt 04
Data file: 1SterQB2019-3B02.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



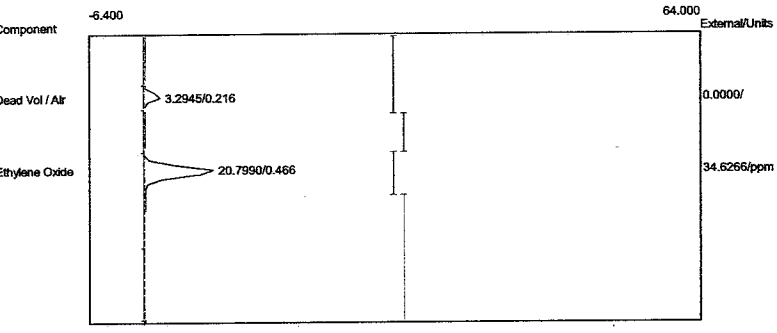
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.3750	0.0000	
Ethylene Oxide	0.466	18.5575	30.8949	ppm
		21.9325	30.8949	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:20:42
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt 04
Data file: 2SterQB2019-3B02.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



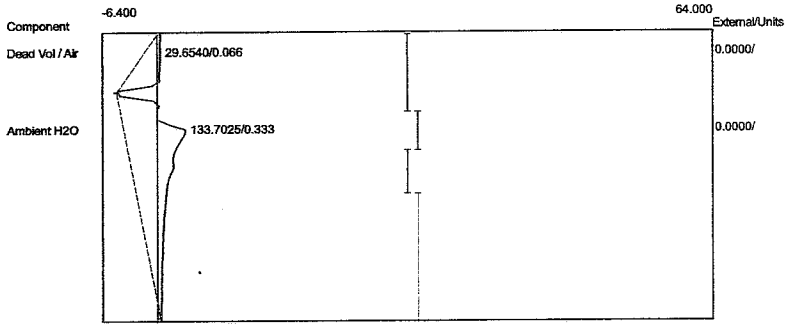
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	29.9340	0.0000	
Ambient H2O	0.350	140.0670	0.0000	
		170.0010	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:21:52
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt 05
Data file: 1SterQB2019-3B~~02~~.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



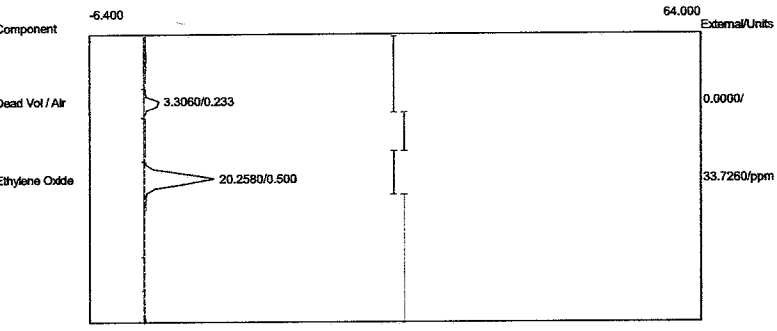
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.2945	0.0000	
Ethylene Oxide	0.466	20.7990	34.6266	ppm
		24.0935	34.6266	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:21:52
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt 05
Data file: 2SterQB2019-3B~~02~~.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



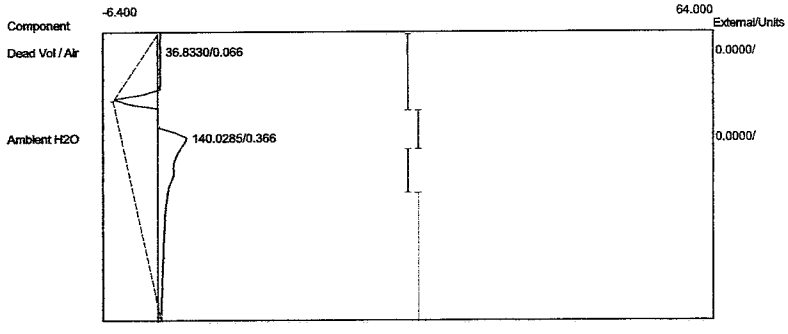
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	29.6540	0.0000	
Ambient H2O	0.333	133.7025	0.0000	
		163.3565	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:23:02
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt 06
Data file: 1SterQB2019-3B~~02~~.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



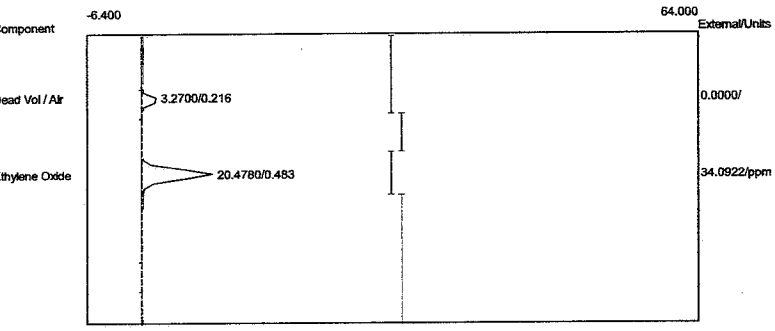
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3060	0.0000	
Ethylene Oxide	0.500	20.2580	33.7260	ppm
		23.5640	33.7260	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:23:02
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt 06
Data file: 2SterQB2019-3B~~02~~.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



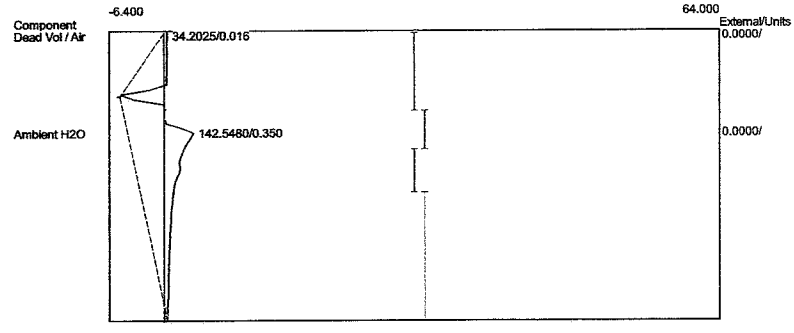
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	36.8330	0.0000	
Ambient H2O	0.366	140.0285	0.0000	
		176.8615	0.0000	

Lab Name: EOSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:24:08
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt 07
Data file: 1SterQB2019-3B02.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



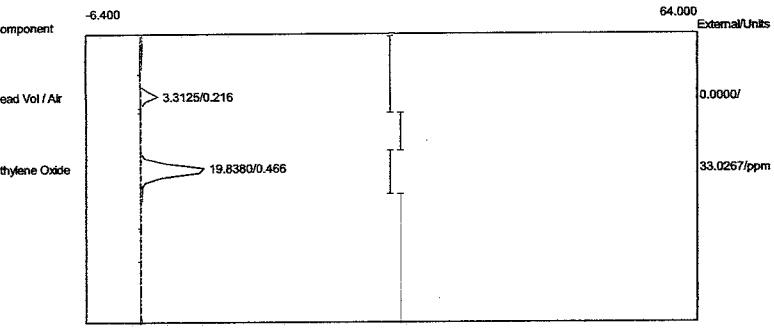
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.2700	0.0000	
Ethylene Oxide	0.483	20.4780	34.0922	ppm
		23.7480	34.0922	

Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:24:08
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt 07
Data file: 2SterQB2019-3B02.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



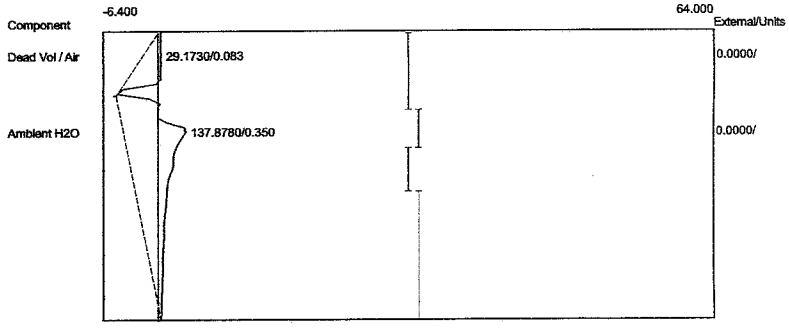
Component	Retention	Area	External	Units
Dead Vol / Air	0.016	34.2025	0.0000	
Ambient H2O	0.350	142.5480	0.0000	
		176.7505	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:25:17
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-3B08.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



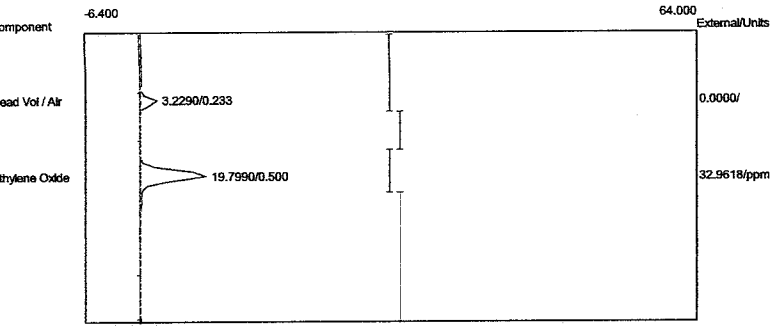
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.3125	0.0000	
Ethylene Oxide	0.466	19.8380	33.0267	ppm
		23.1505	33.0267	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:25:17
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-3B08.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



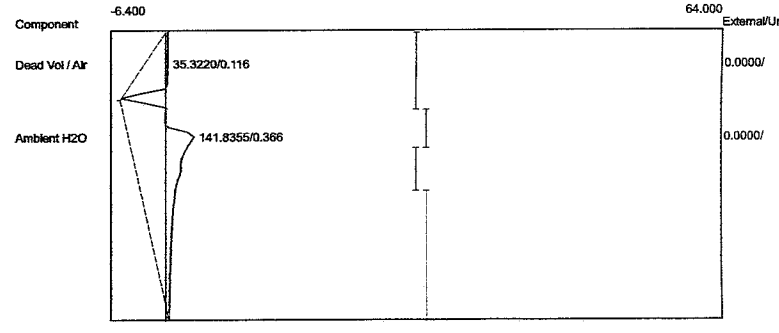
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	29.1730	0.0000	
Ambient H2O	0.350	137.8780	0.0000	
		167.0510	0.0000	

Lab name: EOSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:26:39
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt 09
Data file: 1SterQB2019-3B02.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



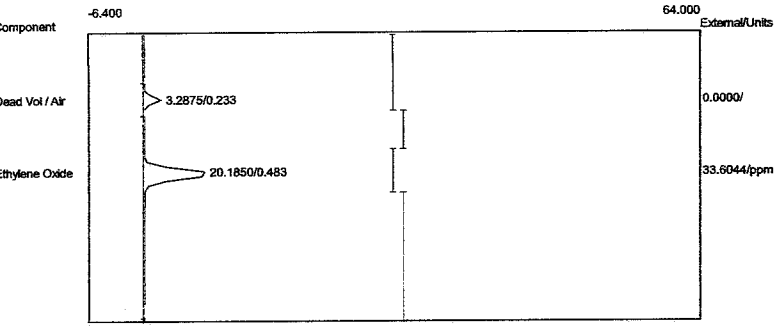
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2290	0.0000	
Ethylene Oxide	0.500	19.7990	32.9618	ppm
		23.0280	32.9618	

Lab name: EOSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:26:39
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt 09
Data file: 2SterQB2019-3B02.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



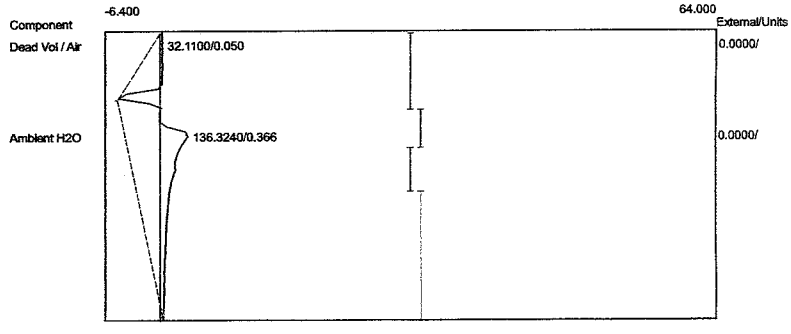
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	35.3220	0.0000	
Ambient H2O	0.366	141.8355	0.0000	
		177.1575	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:27:54
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt 10
Data file: 1SterQB2019-3B02.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



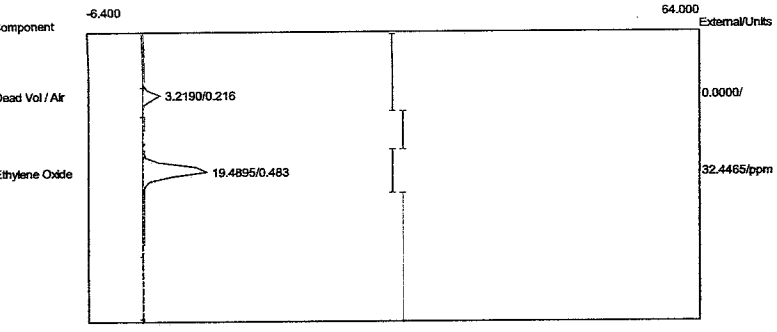
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2875	0.0000	
Ethylene Oxide	0.483	20.1850	33.6044	ppm
		23.4725	33.6044	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:27:54
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt 10
Data file: 2SterQB2019-3B02.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



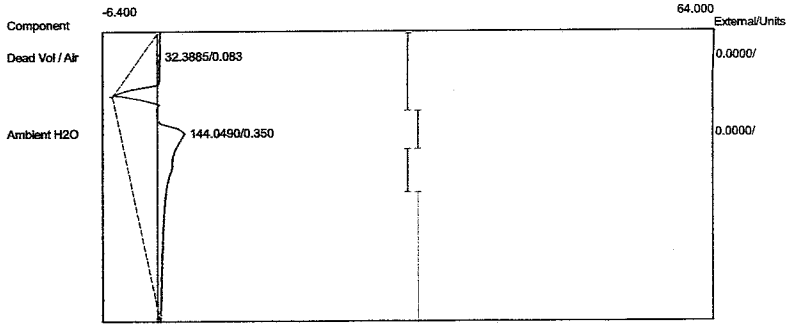
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	32.1100	0.0000	
Ambient H2O	0.366	136.3240	0.0000	
		168.4340	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:29:03
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-3B02.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



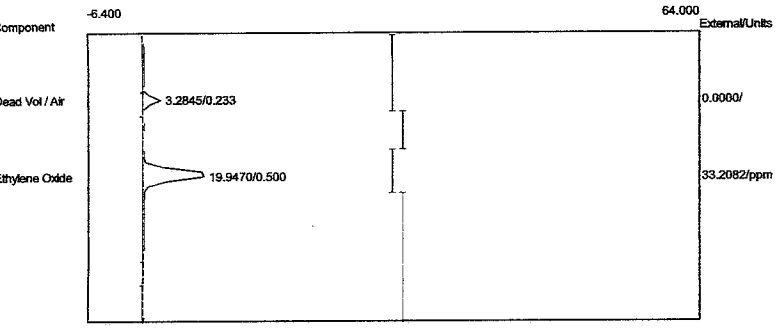
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.2190	0.0000	
Ethylene Oxide	0.483	19.4895	32.4465	ppm
		22.7085	32.4465	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:29:03
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-3B02.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



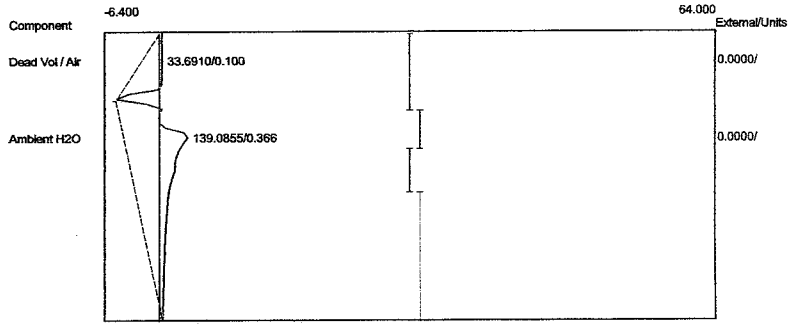
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	32.3885	0.0000	
Ambient H2O	0.350	144.0490	0.0000	
		176.4375	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:30:09
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt 12
Data file: 1SterQB2019-3B02.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2845	0.0000	
Ethylene Oxide	0.500	19.9470	33.2082	ppm
		23.2315	33.2082	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3BV
Analysis date: 12/12/2019 15:30:09
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt 12
Data file: 2SterQB2019-3B02.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer

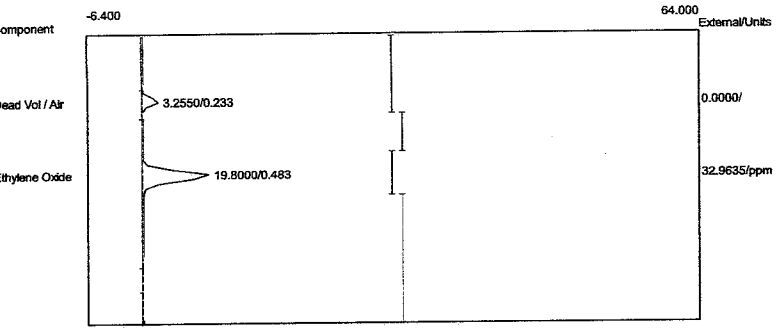


Component	Retention	Area	External	Units
Dead Vol / Air	0.100	33.6910	0.0000	
Ambient H2O	0.366	139.0855	0.0000	
		172.7765	0.0000	

APPENDIX G

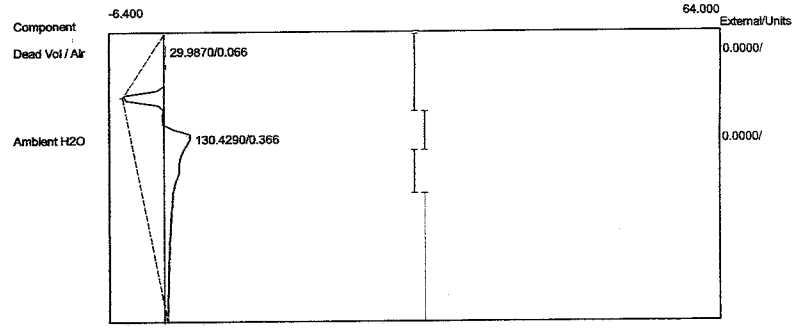
Run #3 Chromatograms – Aeration

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 15:33:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-3A01.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



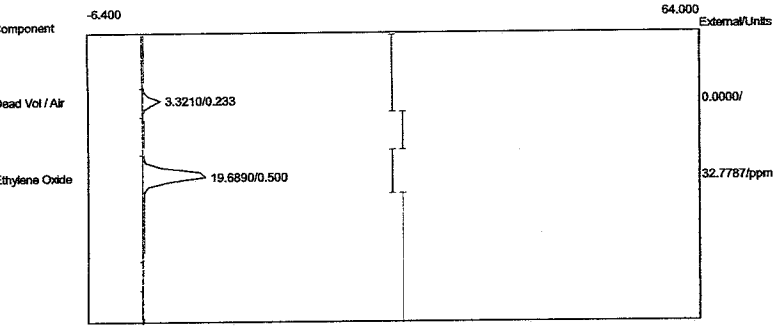
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2550	0.0000	
Ethylene Oxide	0.483	19.8000	32.9635	ppm
		23.0550	32.9635	

Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 15:33:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-3A01.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



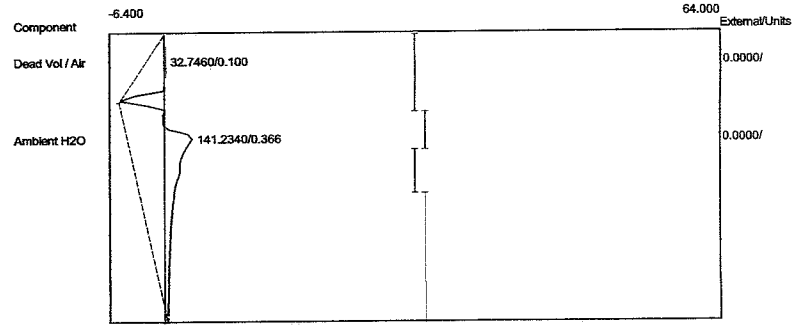
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	29.9870	0.0000	
Ambient H2O	0.366	130.4290	0.0000	
		160.4160	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 15:38:05
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-3A02.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



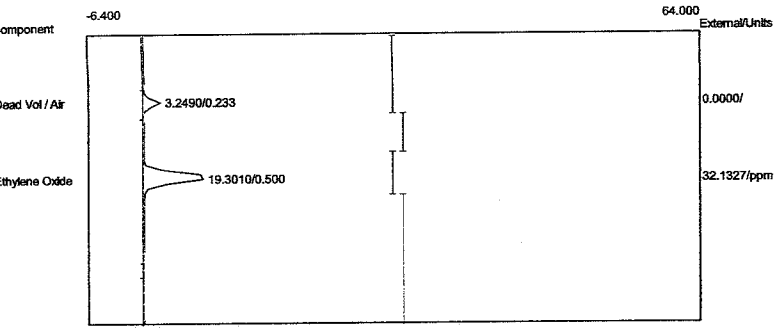
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3210	0.0000	
Ethylene Oxide	0.500	19.6890	32.7787	ppm
		23.0100	32.7787	

Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 15:38:05
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-3A02.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



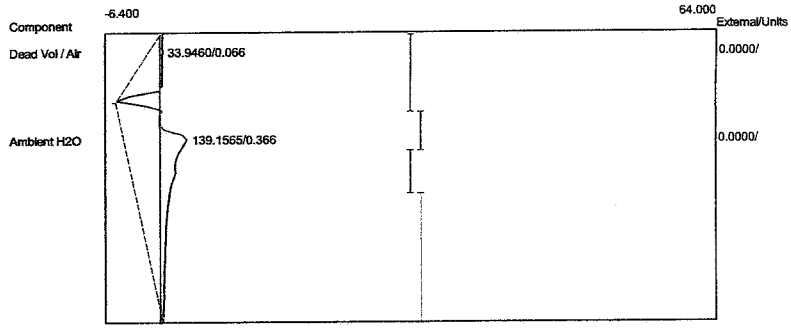
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	32.7460	0.0000	
Ambient H2O	0.366	141.2340	0.0000	
		173.9800	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 15:43:12
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-3A03.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



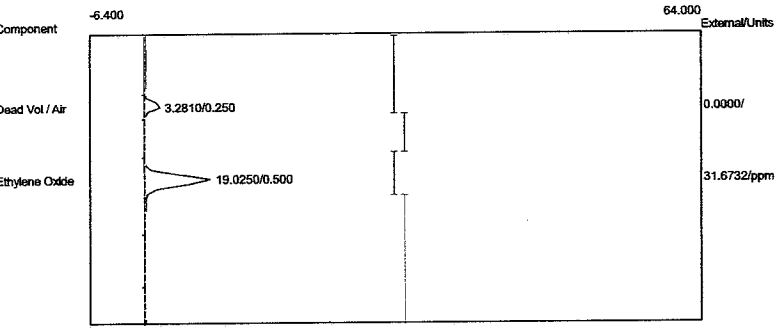
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.2490	0.0000	
Ethylene Oxide	0.500	19.3010	32.1327	ppm
		22.5500	32.1327	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 15:43:12
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-3A03.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



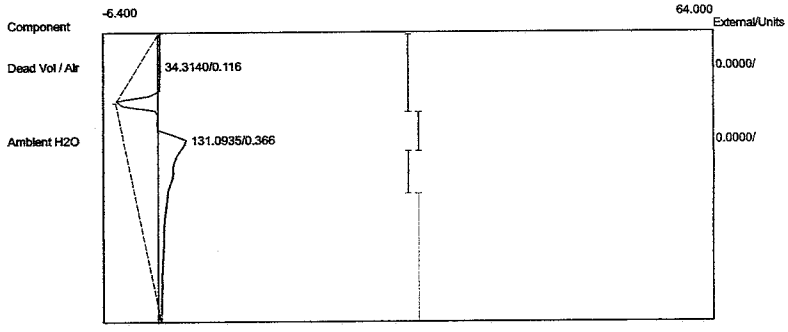
Component	Retention	Area	External	Units
Dead Vol / Air	0.066	33.9460	0.0000	
Ambient H2O	0.366	139.1565	0.0000	
		173.1025	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 15:48:25
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-3A04.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



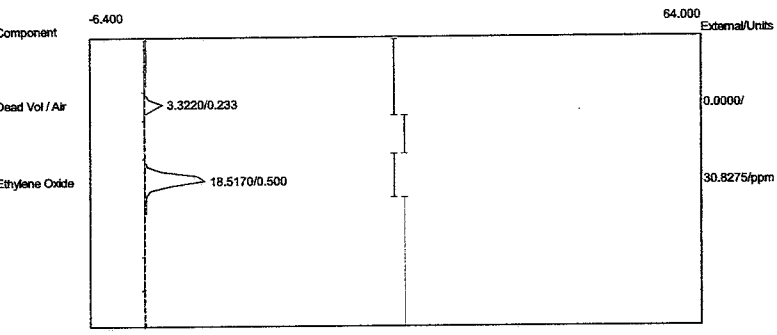
Component	Retention	Area	External	Units
Dead Vol / Air	0.250	3.2810	0.0000	
Ethylene Oxide	0.500	19.0250	31.6732	ppm
		22.3060	31.6732	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 15:48:25
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-3A04.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



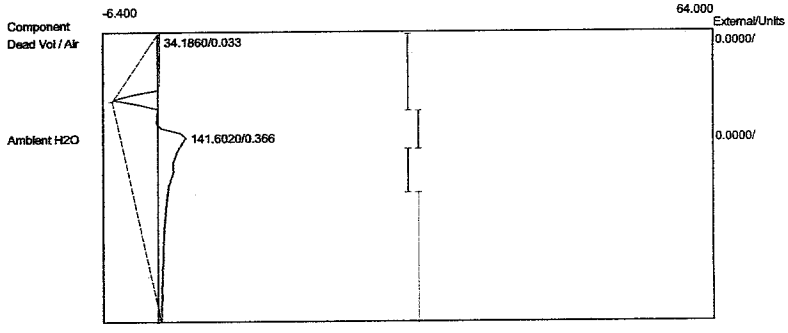
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	34.3140	0.0000	
Ambient H2O	0.366	131.0935	0.0000	
		165.4075	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 15:53:06
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-3A05.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



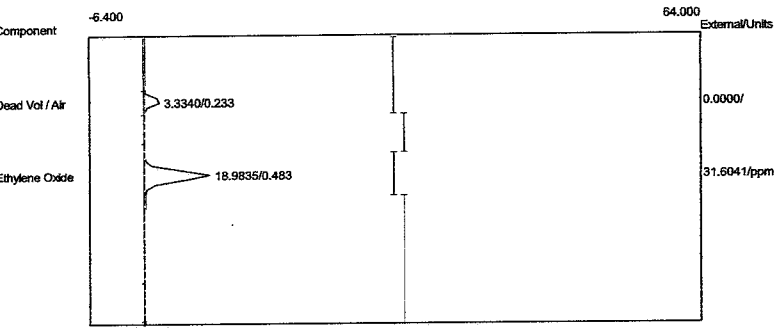
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3220	0.0000	
Ethylene Oxide	0.500	18.5170	30.8275	ppm
		21.8390	30.8275	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 15:53:06
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-3A05.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



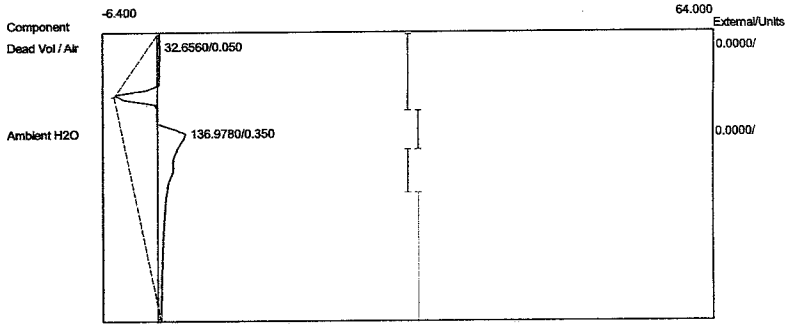
Component	Retention	Area	External	Units
Dead Vol / Air	0.033	34.1860	0.0000	
Ambient H2O	0.366	141.6020	0.0000	
		175.7880	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 15:58:23
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-3A06.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



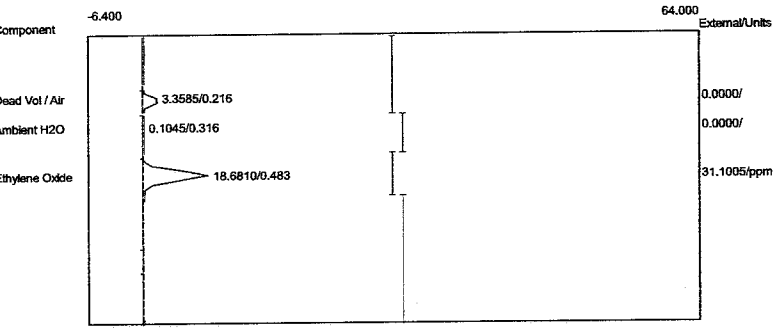
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3340	0.0000	
Ethylene Oxide	0.483	18.9835	31.6041	ppm
		22.3175	31.6041	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 15:58:23
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-3A06.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



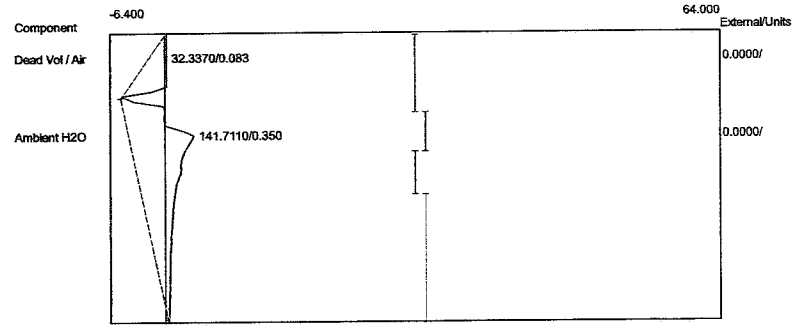
Component	Retention	Area	External	Units
Dead Vol / Air	0.050	32.6560	0.0000	
Ambient H2O	0.350	136.9780	0.0000	
		169.6340	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 16:03:07
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-3A07.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



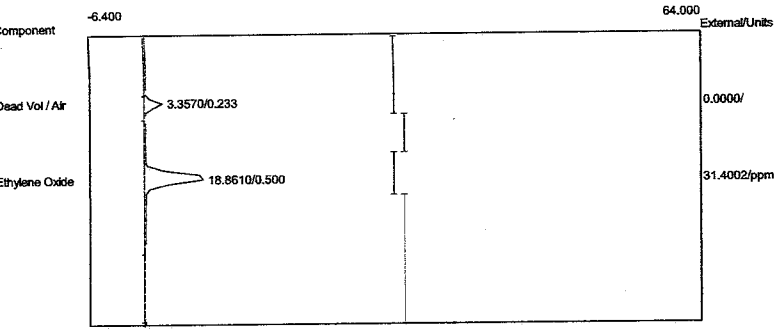
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.3585	0.0000	
Ambient H2O	0.316	0.1045	0.0000	
Ethylene Oxide	0.483	18.6810	31.1005	ppm
		22.1440	31.1005	

Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 16:03:07
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-3A07.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



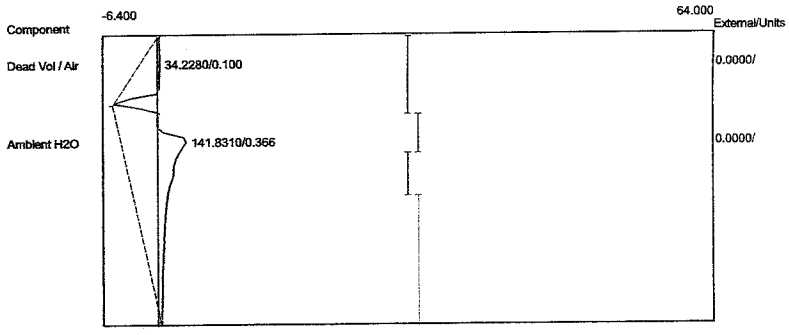
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	32.3370	0.0000	
Ambient H2O	0.350	141.7110	0.0000	
		174.0480	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 16:08:36
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-3A08.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



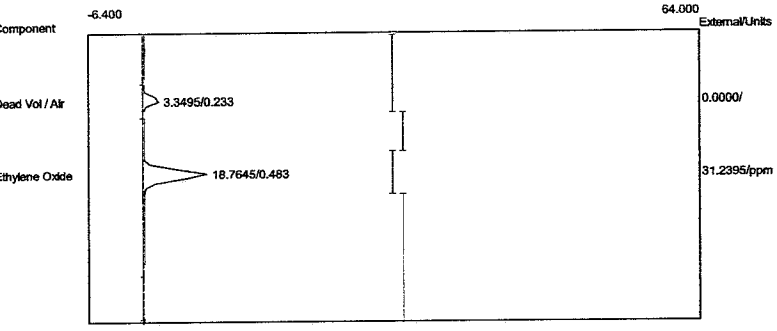
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3570	0.0000	
Ethylene Oxide	0.500	18.8610	31.4002	ppm
		22.2180	31.4002	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 16:08:36
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-3A08.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



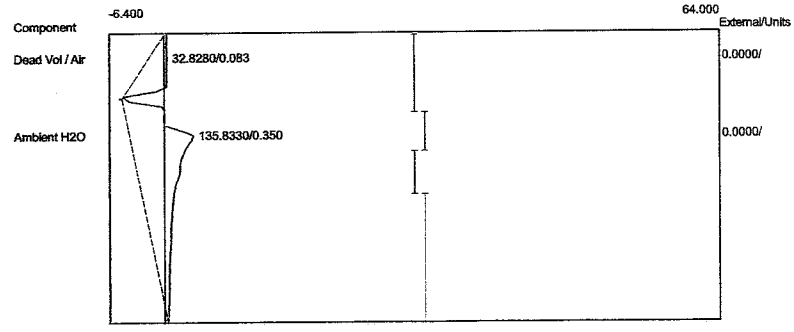
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	34.2280	0.0000	
Ambient H2O	0.366	141.8310	0.0000	
		176.0590	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 16:13:47
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-3A09.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



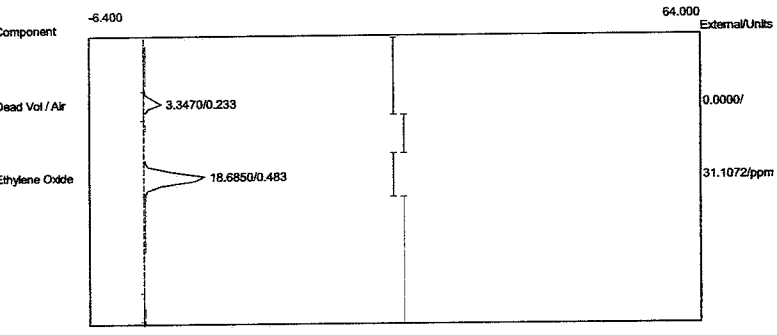
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3495	0.0000	
Ethylene Oxide	0.483	18.7645	31.2395	ppm
		22.1140	31.2395	

Lab name:
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 16:13:47
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-3A09.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



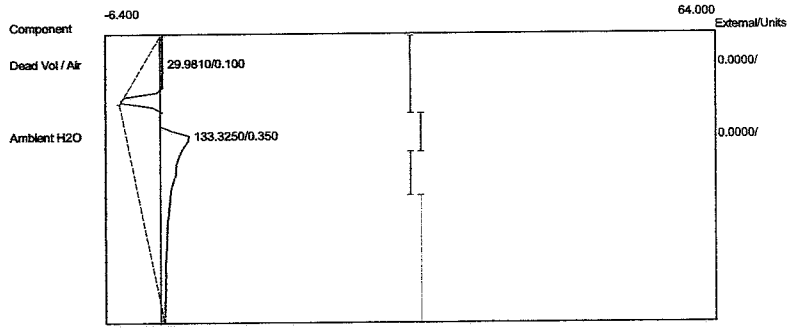
Component	Retention	Area	External	Units
Dead Vol / Air	0.083	32.8280	0.0000	
Ambient H2O	0.350	135.8330	0.0000	
		168.6610	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 16:18:06
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-3A10.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



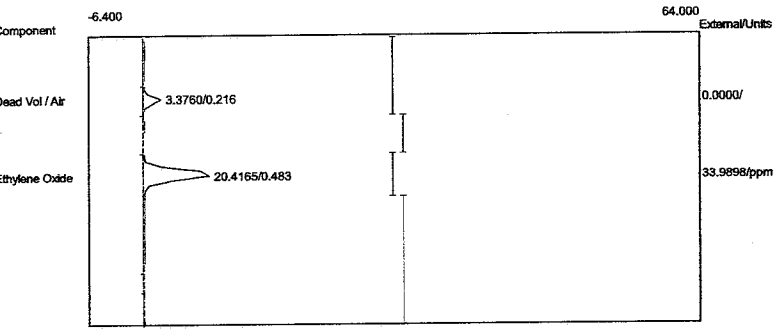
Component	Retention	Area	External	Units
Dead Vol / Air	0.233	3.3470	0.0000	
Ethylene Oxide	0.483	18.6850	31.1072	ppm
		22.0320	31.1072	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 16:18:06
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-3A10.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



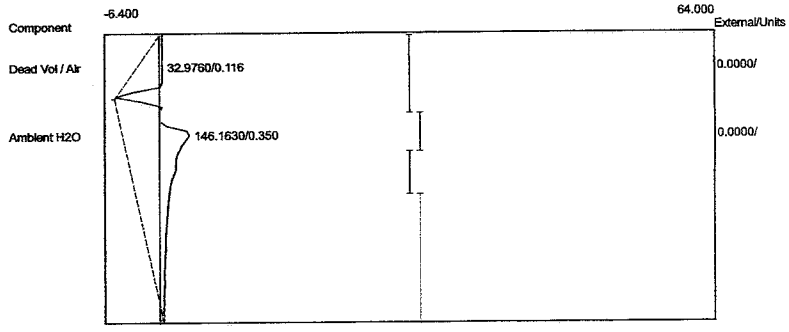
Component	Retention	Area	External	Units
Dead Vol / Air	0.100	29.9810	0.0000	
Ambient H2O	0.350	133.3250	0.0000	
		163.3060	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 16:23:17
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-3A11.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



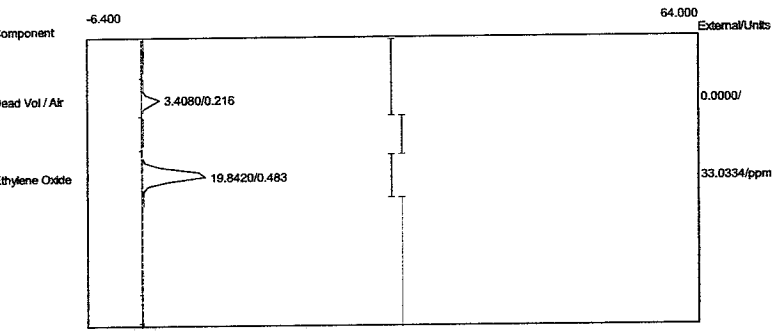
Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.3760	0.0000	
Ethylene Oxide	0.483	20.4165	33.9898	ppm
		23.7925	33.9898	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 16:23:17
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-3A11.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



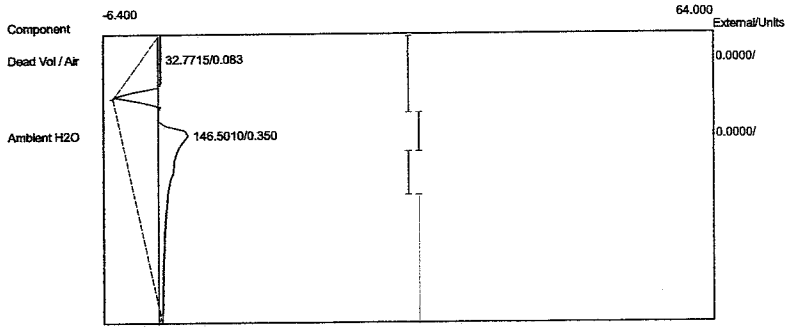
Component	Retention	Area	External	Units
Dead Vol / Air	0.116	32.9760	0.0000	
Ambient H2O	0.350	146.1630	0.0000	
		179.1390	0.0000	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 16:28:34
Method: Direct Injection
Description: CHANNEL 1 - FID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto1-100.cpt
Data file: 1SterQB2019-3A12.CHR (c:\peak359)
Sample: Abator Inlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.216	3.4080	0.0000	
Ethylene Oxide	0.483	19.8420	33.0334	ppm
		23.2500	33.0334	

Lab name: ECSI
Client: Sterigenics - Queensbury
Client ID: Run#3Aer
Analysis date: 12/12/2019 16:28:34
Method: Direct Injection
Description: CHANNEL 2 - PID
Column: 1% SP-1000, Carbopack B
Carrier: HELIUM
Temp. prog: eto-100.tem
Components: eto2-100.cpt
Data file: 2SterQB2019-3A12.CHR (c:\peak359)
Sample: Abator Outlet
Operator: D. Kremer



Component	Retention	Area	External	Units
Dead Vol / Air	0.083	32.7715	0.0000	
Ambient H2O	0.350	146.5010	0.0000	
		179.2725	0.0000	

APPENDIX H

Field Data and Calculation Worksheets

LOD Calculation EtO

Sterigenics - Queensbury, NY

12/12/2019

		Y =	A	+	m	x
Outlet		ppm =	1.06E-02	+	0.478411	x area
Lowest Cal Gas						

	Area	Calc ppm			
	2.39	1.154	ppm	LOD =	A+3s
	2.40	1.159	ppm	LOD =	0.025 ppm
	2.38	1.149	ppm		
AVG		**1.154**	ppm		
Std Dev		**0.005**	ppm		

1/2 LOD = 0.012 ppm

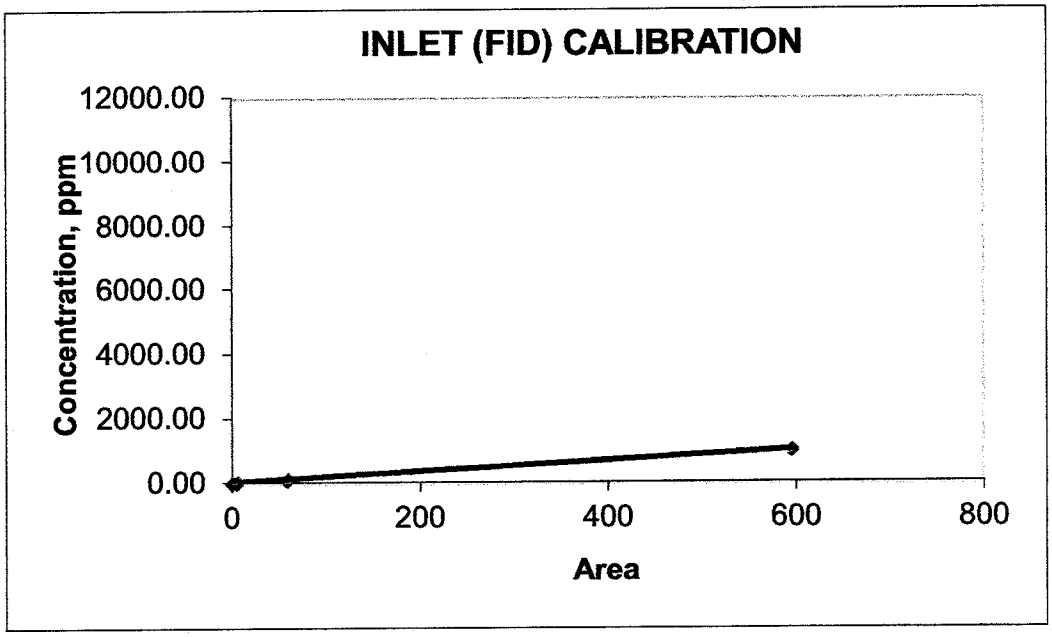
		Y =	A	+	m	x
Inlet		ppm =	-0.01	+	1.68	x area
Lowest Cal Gas						

	Area	Calc ppm			
	0.726	1.211	ppm	LOD =	A+3s
	0.731	1.219	ppm	LOD =	0.022 ppm
	0.729	1.216	ppm		
AVG		**1.215**	ppm		
Std Dev		**0.004**	ppm		

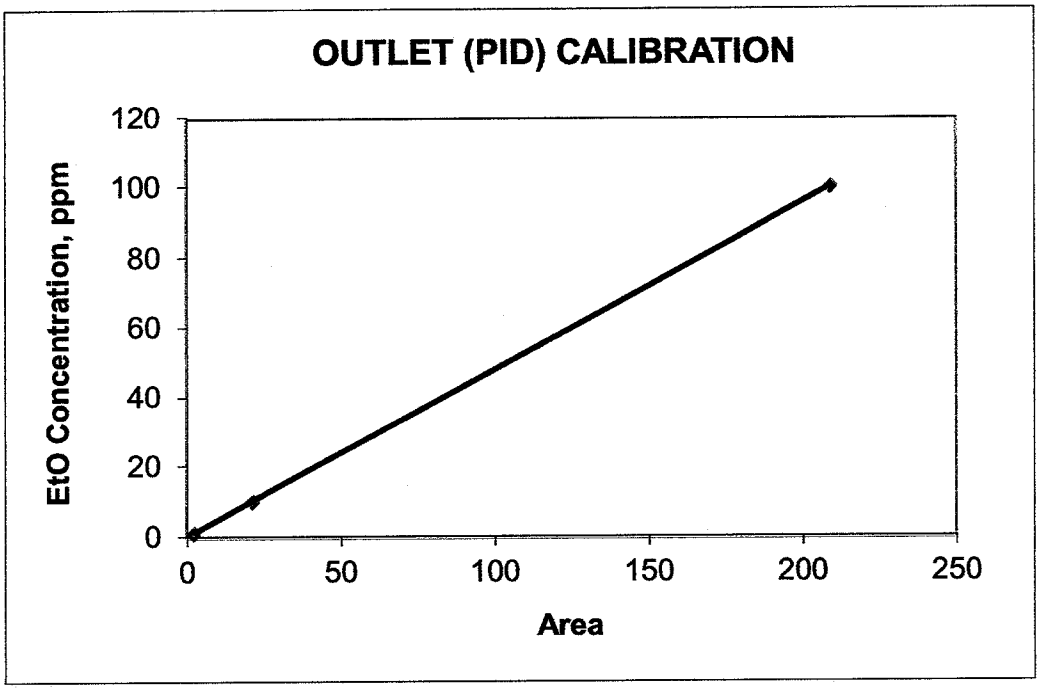
1/2 LOD = 0.011 ppm

EtO Calibrations

Site: **Sterigenics - Queensbury, NY**
Date: **12/12/2019**



Slope **1.68**
Intercept **-0.01**



Slope **0.478**
Intercept **0.0106**

EtO Calibrations

Site: Sterigenics - Queensbury, NY

Date: 12/12/2019

INLET - FID

ppm	0	1.18	10.2	100	1,000	10,080
Area 1	0	0.726	6.04	59.5	600	
Area 2	0	0.731	6.09	59.5	590	
Area 3	0	0.729	6.05	59.6	597	
AVG.	0	0.7287	6.060	59.53	595.7	

	AUDIT DIRECT	AUDIT BIAS
	52.0	52.0
	READS	READS
	51.9	51.3
Dev.	-0.2%	-1.3%

OUTLET - PID

ppm	0	1.18	10.2	100
Area 1	0	2.39	21.2	209
Area 2	0	2.40	21.5	208
Area 3	0	2.38	21.3	210
AVG.	0	2.390	21.33	209.0

	AUDIT DIRECT	AUDIT BIAS
	52.0	52.0
	READS	READS
	51.7	52.7
Dev.	-0.6%	1.3%

MID CAL			
	PPM	READS	Dev.
INLET			#DIV/0!
OUTLET			#DIV/0!

FINAL CAL			
	PPM	READS	Dev.
INLET	100	101	1.0%
OUTLET	1.18	1.19	0.8%

APPENDIX I

Gas Certifications

PRAXAIR
Making our planet more productive

Praxair Distribution, Inc.
ISO 9001 Registered
37256 Highway 30
Geismar, LA 70734
Tel: 225-677-7700
Fax: 225-673-3531

Customer & Order Information:

PRAXAIR PKG SANTA ANA CA HPS
1545 E EDINGER AVE,
SANTA ANA, CA 92705

Praxair Order Number: **70905412**

Certificate Issuance Date: **3/15/2019**

Certification Date: **3/15/2019**
Lot Number: **70340 9067 8D**
Part Number: **NI EO1MP-A3**
DocNumber: **61840**
Expiration Date: **3/14/2021**

CERTIFICATE OF ANALYSIS

Primary Standard

Component	Requested Concentration (Molar)	Certified Concentration (Molar)	Analytical Reference	Analytical Uncertainty
Ethylene oxide	**1 ppm**	**1.18 ppm**	**1**	**± 0.1 ppm**
Nitrogen	**Balance**	**Balance**		

Cylinder Style: **A3**
Cylinder Pressure @ 70 F: **2000 psig**
Cylinder Volume: **28.2 ft3**
Valve Outlet Connection: **CGA 350**
Cylinder Number(s): **EA0023418**

Fill Date: **3/8/2019**
Analysis Date: **3/14/2019**

Filling Method: **Gravimetric**

Analyst: **Ronnie Popularas**

QA Reviewer: **Anthony Perret**

Key to Analytical Techniques:

Reference	Analytical Instrument - Analytical Principle
1	Hewlett-Packard 6890 - Gas Chromatography with FID

The gas calibration cylinder standard prepared by Praxair Distribution, Inc. is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure techniques. The calibration standard provided is certified against Praxair Distribution, Inc. Reference Materials which are either prepared by weights traceable to the National Institute of Standards and Technology (NIST), Measurement Canada, or by using NIST Standard Reference Materials where available.

Note: All expressions for concentration (e.g., % or ppm) are for gas phase, by volume (e.g., ppmv) unless otherwise noted. Analytical uncertainty is expressed as a Relative % unless otherwise noted.

PRAXAIR
Making our planet more productive

Praxair Distribution. Inc.
ISO 9001 Registered
37256 Highway 30
Geismar, LA 70734
Tel: 225-677-7700
Fax: 225-673-3531

Customer & Order Information:

PRAXAIR PKG SANTA ANA CA HPS
1545 E EDINGER AVE,
SANTA ANA, CA 92705

Praxair Order Number: **70905412**

Certificate Issuance Date: **3/15/2019**

Certification Date: **3/15/2019**
Lot Number: **70340 9067 8E**
Part Number: **NI EO10MP-A3**
DocNumber: **61842**
Expiration Date: **3/14/2021**

CERTIFICATE OF ANALYSIS

Primary Standard

Component	Requested Concentration (Molar)	Certified Concentration (Molar)	Analytical Reference	Analytical Uncertainty
Ethylene oxide	**10 ppm**	**10.2 ppm**	**1**	**± 1 %**
Nitrogen	**Balance**	**Balance**		

Cylinder Style: **A3**
Cylinder Pressure @ 70 F: **2000 psig**
Cylinder Volume: **28.3 ft3**
Valve Outlet Connection: **CGA 350**
Cylinder Number(s): **EA0022418**

Fill Date: **3/8/2019**
Analysis Date: **3/14/2019**

Filling Method: **Gravimetric**

Analyst: **Ronnie Popularas**

QA Reviewer: **Anthony Perret**

Key to Analytical Techniques:

Reference	Analytical Instrument - Analytical Principle
1	Hewlett-Packard 6890 - Gas Chromatography with FID

The gas calibration cylinder standard prepared by Praxair Distribution, Inc. is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure techniques. The calibration standard provided is certified against Praxair Distribution, Inc. Reference Materials which are either prepared by weights traceable to the National Institute of Standards and Technology (NIST), Measurement Canada, or by using NIST Standard Reference Materials where available.

Note: All expressions for concentration (e.g., % or ppm) are for gas phase, by volume (e.g., ppmv) unless otherwise noted. Analytical uncertainty is expressed as a Relative % unless otherwise noted.

PRAXAIR
Making our planet more productive

Praxair Distribution. Inc.
ISO 9001 Registered
37256 Highway 30
Geismar, LA 70734
Tel: 225-677-7700
Fax: 225-673-3531

Customer & Order Information:

PRAXAIR PKG SANTA ANA CA HPS
1545 E EDINGER AVE,
SANTA ANA, CA 92705

Praxair Order Number: **70953858**
Customer PO Number: **78936543**

Certificate Issuance Date: **5/6/2019**

Certification Date: **5/6/2019**
Lot Number: **70340 9119 1F**
Part Number: **NI EO100P-A3**
DocNumber: **71177**
Expiration Date: **4/30/2021**

CERTIFICATE OF ANALYSIS

Primary Standard

Component	Requested Concentration (Molar)	Certified Concentration (Molar)	Analytical Reference	Analytical Uncertainty
Ethylene oxide	**100 ppm**	**100 ppm**	**1**	**± 1 %**
Nitrogen	**Balance**	**Balance**		

Cylinder Style: **A3**
Cylinder Pressure @ 70 F: **2000 psig**
Cylinder Volume: **28.7 ft3**
Valve Outlet Connection: **CGA 350**
Cylinder Number(s): **EA0023428**

Fill Date: **4/29/2019**
Analysis Date: **4/30/2019**

Filling Method: **Gravimetric**

Analyst: **Ronnie Popularas**

QA Reviewer: **Blayne Griffin**

Key to Analytical Techniques:

Reference	Analytical Instrument - Analytical Principle
1	Hewlett-Packard 6890 - Gas Chromatography with FID

The gas calibration cylinder standard prepared by Praxair Distribution, Inc. is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure techniques. The calibration standard provided is certified against Praxair Distribution, Inc. Reference Materials which are either prepared by weights traceable to the National Institute of Standards and Technology (NIST), Measurement Canada, or by using NIST Standard Reference Materials where available.

Note: All expressions for concentration (e.g., % or ppm) are for gas phase, by volume (e.g., ppmv) unless otherwise noted. Analytical uncertainty is expressed as a Relative % unless otherwise noted.

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

2300 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-005
Item No.: 0202000134OTCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM002810
Cylinder Size: CL
Certification Date: 20Apr2018

Customer

ECSI, INC
PO BOX 1498
SAN CLEMENTE, CA 92674

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	1,000.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCall BLM DATE: 4-20-18

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	1,000.	PPM	1,000.	PPM	.0	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 1200 PSIG
Expiration Date: 20Apr2020

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFIED WORKING CLASS

Single-Certified Calibration Standard

Scott Specialty Gases

2600 CAJON BLVD., SAN BERNARDINO, CA 92411 Phone: 909-887-2571 Fax: 909-887-0549

CERTIFICATE OF ACCURACY: Certified Working Class Calibration Standard

Product Information
Project No.: 02-57164-006
Item No.: 02020001340TCL
P.O. No.: VBL – D. KREMER

Cylinder Number: CLM005787
Cylinder Size: CL
Certification Date: 20Apr2018

Customer

ECSI, INC
PO BOX 1498
SAN CLEMENTE, CA 92674

CERTIFIED CONCENTRATION

Component Name	Concentration (Moles)		Accuracy (+/-%)
ETHYLENE OXIDE	10,080.	PPM	5
NITROGEN		BALANCE	

TRACEABILITY

Traceable To

Scott Reference Standard

APPROVED BY: B. McCully BLM DATE: 4-20-18

SPECIFICATIONS

Component Name	Requested Concentration (Moles)		Certified Concentration (Moles)		Blend Tolerance Result (+/- %)	Certified Accuracy Result (+/- %)
ETHYLENE OXIDE	10,000.	PPM	10,080.	PPM	.8	5.00
NITROGEN		BAL		BAL		

TRACEABILITY

Traceable To
Scott Reference Standard

PHYSICAL PROPERTIES

Cylinder Size: CL

Pressure: 700 PSIG
Expiration Date: 20Apr2020

Valve Connection: CGA 350

SPECIAL HANDLING INSTRUCTIONS

Do not use or store cylinder at or below the stated dew point temperature. Possible condensation of heavier components could result. In the event the cylinder has been exposed to temperatures at or below the dew point, place cylinder in heated area for 24 hours and then roll cylinder for 15 minutes to re-mix.

Use of calibration standards at or below dew point temperature may result in calibration error.

COMMENTS

CERTIFICATE OF ANALYSIS

Customer Name:	Environmental Compliance Specialists, Inc	**Cylinder Number:**	CAL-4448
Stock / Analyzer Tag #:	A006-1040-50PNC	**Product Class**	Certified Standard
Customer Reference:	Verbal Dan	**Cylinder Contents (1):**	28 CF @ 2000 PSI
MESA Reference:	124691	**Cylinder CGA:**	A006-HP-350/BR
Date of Certification:	April 17, 2019	**Analysis Method:**	GC-TCD
Recommended Shelf Life:	2 Years	**Preparation Method:**	Gravimetric

Component	**Requested Concentration (2)**	**Reported Concentration (2,3)**
Ethylene Oxide	50 ppm	52 ppm
Nitrogen	Balance	Balance

Authorized Signature: _____

(1) The fill pressure shown on the COA is as originally quoted. The fill pressure measured by the customer may differ from the fill pressure originally quoted due to temperature effects, compressibility of the individual components when blended together in the cylinder, gauge accuracy or reduction in content volume before shipping as a result of samples withdrawn for laboratory QC necessary to ensure product quality.
(2) Unless otherwise stated, concentrations are given in molar units.
(3) Vapor pressure mixes are blended at a sufficiently low pressure so as to eliminate phase separation under most low temperature conditions encountered during transport or storage. However, it is generally recommended that cylinders containing vapor pressure restricted mixes be placed on the floor in a horizontal position and rolled back and forth to improve homogeneity of the gas phase mixture before being put into service.

Analytical Gas Standards are prepared and analyzed using combinations of NIST traceable weights, SRM's provided by NIST, or internal gas standards that have been verified for accuracy using procedures published by the US-EPA. Pure gases are analyzed and certified for purity using minor component Analytical Gas Standards prepared according to the methods specified above. Balances are calibrated to NIST test weights covered by NIST test number 822/278982-10. Reference Certification #'s:1072/Z, 833/AB and 3280/H.
Calibration methods are in conformance with MIL-STD 45662A.

MESA Specialty Gases & Equipment
division of MESA International Technologies, Inc.
2427 S. Anne St. • Santa Ana, California 92704 • USA
TEL: 714-434-7102 • FAX: 714-434-8006 • E-mail: mail@mesagas.com
On-line Catalog at www.mesagas.com